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Development of conceptual framework and methodology for enhancing long term coping skills to improve psychological and physiological well-being

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**Development of conceptual framework and methodology
for enhancing long term coping skills to improve
psychological and physiological well-being**

Steven Dean

A thesis submitted for the degree of Doctor of Philosophy

University of Bath

Department of Psychology

September 2014

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Abstract

A wealth of information exists on self-regulatory processes that have the potential to generate a population shift in health and well-being, but there are many barriers to progress. This thesis addresses three. The first is a lack of transparency and coherence in terminology surrounding 'stress' and 'well-being'. This was addressed using a taxonomy based on self-regulatory theory to provide a platform for clearer differentiation and enhancement of psychological coping mechanisms. The second is the difficulty illuminating a public deluged with contradictory information. This was addressed by demonstrating a means of generating publicly available, validated instruments of change, through more open, transparent and collaborative research. The third barrier is that information provision alone is not enough to induce sustainable behaviour change. This was addressed by systematically exploring ways of optimising intervention adherence, impact and adaptive habit formation.

The research programme consisted of three experimental studies. Study 1 piloted a means of adding depth and ingenuity to efforts to achieve personal daily goals, using an adaptation of Pennebaker's experimental writing paradigm, underpinned by social cognitive theory. Framework analysis of interviews with participants led to the development of a web-based version of the intervention, incorporating elements from dual-processing theory.

Study 2 investigated effects of this intervention on self-report measures of psychological well-being in a group of 33 university administrators, assessed at baseline and four follow-up time points over twelve months. Sustained improvements were significant for goal progress, self-efficacy, perceived stress, negative affect, and symptoms of anxiety and depression.

Study 3 tested the intervention using a randomised controlled trial involving 101 local government administrators. The results for self-report measures further supported and extended the findings of Study 2, whilst additional cortisol assessment proved inconclusive. Overall, the findings demonstrate a viable means of extending self-regulatory knowledge central to the pursuit of psychological and physiological well-being.

List of Abbreviations

ANCOVA	Analysis of covariance
ANOVA	Analysis of variance
AUC	Area under the curve
BCa CI	Bias corrected and accelerated confidence intervals
BCC	Bristol City Council
BCT	Behaviour change technique
BMI	Body mass index
CAR	Cortisol awakening response
CBM	Cognitive bias modification
CBSM	Cognitive-behavioural stress management
CBT	Cognitive behaviour therapy
CFC	Consideration of future consequences
COPE	Coping orientation to problems experienced
DB	Daily break
DF	Daily focus
DWS	Daily writing session
GOSS	Goal-oriented subjective status
GSE	Generalized self-efficacy
GSFC	Goal-state functional coping
HADS	Hospital anxiety and depression scale
HINT	Habit index of negative thinking
HPA	Hypothalamic pituitary adrenal
HTTPS	Hypertext transfer protocol secure
IQ	Intelligence quotient
ISEL	Interpersonal support evaluation list
LDL	Low density lipoprotein
LOT-R	Revised life orientation test
MM	Mixed methods
MRC	Medical Research Council
NCS	Need for cognition scale
PCA	Principal components analysis
PI	Perceptual intelligence
PNES	Positive and negative emotional style
PSS	Perceived stress scale
PTSD	Post-traumatic stress disorder
RCT	Randomized controlled trial
SCT	Social cognitive theory
SD	Standard deviation
SDT	Self-determination theory
SES	Self-esteem scale
SI	Strategic intelligence
SMS	Short messaging service
TGN	Training guidance notes
TI	Tactical intelligence
TIPI	Ten item personality inventory
W-BNS	Work-related basic need satisfaction
WHO	World Health Organization

CHAPTER 1: INTRODUCTION

This chapter explains the focus of this thesis, the specific research questions addressed, the methods used and expected contribution.

1.1 Thesis focus and reasoning

This thesis explores ways of improving the development and transmission of self-regulatory knowledge and skills, important for both psychological and physical well-being.

Karoly (1993) defines 'self-regulation' as referring to "*those processes, internal and/or transactional, that enable an individual to guide his/her goal-directed activities over time and across changing circumstances (contexts). Regulation implies modulation of thought, affect, behaviour, or attention via deliberate or automated use of specific mechanisms and supportive metaskills*" (p. 25).

These processes and skills are fundamentally important in helping individuals shape their behaviour to achieve what they want from life. Paradoxically, though central to the pursuit of human happiness, these skills remain largely invisible and are rarely measured or formally taught. There is an evident need for better education in such skills, however, given the wide range of personal and social problems that can be traced to poor self-regulation. Baumeister & Heatherton (1996), for example, cite "*crime, teen pregnancy, alcoholism, drug addiction, venereal disease, educational underachievement, gambling and domestic violence*" (p. 1), as just some of the many problems that have self-regulation failure at their core.

Self-regulation, however, is not just about self-control. As noted by Karoly (1993), it also involves appropriate goal selection and there is evidence to suggest that many of our goal choices may also be maladaptive. Layard (2005), for example, argues that the pursuit of happiness through material consumption and the quest for status or fame, is not only unsustainable at an environmental level (e.g., due to issues of pollution, resource depletion and climate change), but also at a population level, as these pursuits are based on fixed resources and 'zero-sum' games, where one person's gain requires another's loss. Furthermore, as technology increases the impact of human behaviour on the environment, the need to address our maladaptive tendencies becomes ever more important.

Layard stresses that to secure a stable future, we need to promote goals that are (a) sustainable, and (b) realistically achievable for most people. Achieving this will require deeper understanding of human motivation and self-regulation to discover how best to

satisfy human needs globally and sustainably. It will also require widespread dissemination and application of more appropriate goal pursuits to achieve sufficient critical mass to reverse current trends.

The thesis, therefore, seeks to support the development and dissemination of self-regulatory knowledge and skills in the following three ways:

1. Helping focus attention on the most useful lessons of research

Problem

There is a vast amount of accumulated knowledge within the field of psychology that could help people better understand their emotions and manage their lives. Most people, however, are unlikely to know where or how to access, or have the time to assimilate, such information. Whatever ultimately reaches them via the media, mass marketing or other third party channels, runs the risk of being misrepresented, misinterpreted or simply wrong.

Proposed solution

Psychologists can help by endeavouring to distil and better communicate the core information. What constitutes the core, however, is debatable. Three criteria are proposed. The first is that it should be true/correct, or at least our best approximation of the truth and hence evidence-based. The second is that it should be easily comprehensible, i.e., its workings explicit and easily understood. The third is that it should be adequately comprehensive, i.e., addressing key issues.

The main intervention developed in this thesis serves as an illustration of how these three principles might be met. It is based on research evidence, a functional taxonomy that makes its workings explicit, and attempts to address self-regulation in a comprehensive way, from goal selection to goal attainment.

2. Helping develop efficient ways of promoting not just awareness, but also more widespread application of currently existing self-regulatory knowledge and skills

Problem

Though informing the public about self-regulation is clearly important, it is not enough to bring about behaviour change. The skills need to be learnt and regularly applied to make a difference to people's everyday lives.

Proposed solution

This thesis explores an alternative method to conventional public information campaigns. This involves:

- Transmitting information in the form of training packages/interventions encouraging direct application of skills and techniques.
- Designing the training so that it can ultimately be used as a standalone package. This should avoid the cost and ultimately resource constraint of requiring third parties to deliver the training. This, however, carries the additional responsibility of identifying the people for whom and contexts in which the training will work and not work.
- Designing the interventions to be web-based, so that they can be widely accessed.
- Ultimately making the interventions as powerful as possible, so that they can effectively promote themselves.
- Encouraging more collaboration amongst 'experts' to help:
 - unify disparate research interests and efforts;
 - build a critical mass behind 'accredited/validated' interventions;
 - exert a greater impact on public awareness.

3. Helping develop further insights into self-regulatory mechanisms and the dynamics of behaviour change

Problem

Though it is important to transmit what is already known, there is still much more to learn. Behaviour change, particularly sustainable behaviour change, is difficult to achieve, as demonstrated for example with smoking cessation (e.g., Rigotti, 2002) and dieting (e.g., Elfhag & Rössner, 2005). Trying to change maladaptive cognitions, which are not directly observable, is arguably even more challenging.

Proposed solution

The approach advocated and explored within this thesis is to build ongoing research into the skills transmission process. Thus, as participants receive training in various self-regulatory techniques, researchers gain feedback on the learning and application of these techniques. This builds the evidence base and should lead to ever more powerful interventions.

The vehicle used to deliver the training is an adaptation of Pennebaker's experimental writing paradigm (Pennebaker & Beall, 1986), which offers the following advantages:

- It can be used to induce specific self-regulatory mechanisms in isolation to examine their strengths and limitations.
- It can be used to explore combinations of different techniques to see whether they are complementary or undermine each other.

- The reliance on written instructions, with no third party / intermediary delivering the training, facilitates experimental control and ease of replication.
- Participants' written output can provide valuable insights into the comprehension and application of self-regulatory techniques.
- The use of repeated writing tasks offers a means of exploring issues of adherence and habit formation.

1.2 Research focus

This thesis addresses three core research questions. These are whether an extended and more sophisticated version of Pennebaker's experimental writing paradigm can be successfully used to:

1. induce distinctive sets of self-regulatory psychological coping mechanisms;
2. differentiate their effects on psychological and physiological well-being;
3. investigate factors facilitating or impeding the learning, application and maintenance of new self-regulatory coping skills.

The interventions tested in this programme of research were principally presented as ways of combatting general life stress. Though self-regulatory knowledge and skills have a broader application potential, stress was highlighted for the following reasons:

- There was perceived to be greater scope for improvement in attempting to shift people from a negative to positive, rather than neutral to positive, emotional state. Targeting interventions at people who are stressed should, therefore, increase the chances of detecting any intervention effects.
- It was thought that organisational gatekeepers and prospective participants would respond more readily to something presented as 'stress management' rather than 'self-regulation', as 'stress', despite criticisms addressed in Chapter 2, is a more widely recognised term.
- The focus on general life stress, as opposed to a single specific stressor (e.g., chronic illness), was deemed to provide a greater opportunity to test a wider range of self-regulatory skills. It also avoided the problem of trying to determine whether the major stressor was 'controllable', which would have implications for the type of coping strategies available.
- Though people face a diverse range of self-regulatory challenges (e.g., dieting, exercising, giving up smoking, etc.), coping with general life stressors is relevant to everyone. Furthermore, stress in general can contribute to specific self-regulatory

problems, such as maintaining a healthy diet (e.g., Wardle, Steptoe, Oliver, & Lipsey, 2000).

- Although work stress features quite prominently, it was not the sole focus of the research. Its prominence arose out of the context, i.e., office environments, which were chosen for the following reasons:
 - It was thought that office workers would offer a more consistent experimental baseline compared to students, who are commonly recruited for psychological research. The latter, for example, tend to have more variable attendance requirements and peaks and troughs of stress across the year, e.g., exam periods versus holidays.
 - It was expected that stressors in sedentary office environments would be psychological rather than physical. This was thought to offer a more level playing field for exploring the results of purely psychological interventions.

There were four principal research aims:

1. To create a framework for the development and testing of distinctive sets of self-regulatory coping skills

The reason for this aim, as demonstrated in Chapter 2, is that much stress-management training involves a mix of diverse mechanisms, making it difficult to determine the source of any benefits. Ultimately, the more coping skills one can apply the better. However, it would be beneficial to know the relative contribution of different types of coping mechanism, how they can be optimally combined and what works best for whom and in what situations. Psychological coping, however, is extremely complex and fluid and it is difficult to separate out categories of thinking skills in a meaningful way, i.e., into groupings that can function as distinctive coping mechanisms. Furthermore, different researchers use different terms for similar functions, which can cause confusion. The first aim, therefore, was to provide a clear rationale and framework for the development and testing of distinctive coping mechanisms. The specific objectives were:

- (i) to review limitations of existing psychological coping taxonomies;
- (ii) to develop a taxonomy based on distinctive theoretical functional mechanisms.

2. To systematically develop a writing-based intervention seeking to optimize the learning and application of a particular coping mechanism within this taxonomy

The core intervention developed was a form of active coping involving direct engagement with problems. Specific objectives were:

- (i) To develop an intervention fulfilling the following criteria:
 - a) providing a distinctive way of coping with stress that can be clearly differentiated from other categories within the taxonomy;
 - b) explicitly based on psychological theory;
 - c) seeking to optimise the potency of the particular mechanism(s) involved;
 - d) capable of being self-administered, i.e., requiring no third party input;
 - e) amenable to testing issues of long-term sustainability.
- (ii) To initially pilot the intervention in a format based on Pennebaker's established writing paradigm.
- (iii) To develop and test an online version of the intervention enhanced with feedback from the initial pilot study.
- (iv) To further refine the online intervention and test it against an alternative coping mechanism by means of a randomised controlled trial, i.e., to control for any placebo effects.

3. To investigate the effects of the interventions on aspects of psychological and physiological well-being

Key objectives were:

- (i) To investigate the nature and timing of any changes in well-being resulting from the interventions. Two aspects of well-being were addressed:
 - a) psychological well-being – through subjective self-report measures;
 - b) physiological well-being – through assessment of levels of cortisol, a key stress hormone measured in saliva.
- (ii) To identify and investigate factors influencing reactions to or outcomes of the interventions. It was important to address both positive and negative effects.
- (iii) To test the interventions with healthy, office-based working adults. As mentioned above, the aim was to try to ensure 'relatively' homogeneous testing conditions (e.g., non-physically demanding work, similar daytime hours), particularly important for later cortisol testing.
- (iv) To investigate the sustainability of any changes.
- (v) To relate any findings to theoretical models purporting to explain key processes involved.

4. To consider issues relating to the possible further development and wider application of the research

Key issues considered included:

- (i) limitations of the methodology;
- (ii) outstanding questions and possible avenues for further investigation;
- (iii) suggested strategies for improving cooperation and coordination of research efforts.

1.3 Epistemological approach

This thesis explores relationships between patterns of cognition, emotion, behaviour and (in Study 3 – Chapter 8) levels of the stress hormone cortisol. The aim is to be able to make valid and reliable generalizations about patterns of change in these relationships and possible causal mechanisms in response to self-regulatory writing interventions. Given the diverse range of subject matters, from mental representations to biological measures, a mixed-methods (MM) approach was adopted, i.e., involving both qualitative and quantitative techniques.

1.3.1 Theoretical issues

It is important to address the ontological and epistemological assumptions underpinning the research, as they determine the nature of the interpretations that can be drawn from results. Reviewing the theoretical foundations of MM research, Teddlie & Tashakkori (2009) highlighted five distinct philosophical paradigms. These ranged from positivism, closely associated with the natural sciences, through post-positivism, pragmatism and the transformative perspective, to constructivism, commonly associated with analysis of social discourse. Teddlie & Tashakkori (2009) suggested that if one were to select a single paradigm for MM research, either 'pragmatism' or the 'transformative perspective' would be most appropriate.

However, the adoption of a single paradigm for MM use is just one of several contemporary approaches considered. Teddlie & Tashakkori (2003) outlined six alternatives:

1. The A-Paradigmatic Stance
2. The Incompatibility Thesis
3. The Complementary Strengths Thesis
4. The Single Paradigm Thesis
5. The Multiple Paradigms Thesis
6. The Dialectical Thesis

The approach closest to the position of the present research is the 'Multiple Paradigms Thesis'. This asserts that different paradigms should be used for different elements of a mixed methods project. With research into stress, for example, the following paradigm use might apply:

- (i) **positivist** for tightly controlled laboratory-based psychophysiological stress testing;
- (ii) **post-positivist** for less controllable field experiments;
- (iii) **pragmatist**, for example, in adopting conceptual models for instrumental value rather than absolute truth;
- (iv) **transformative** in encouraging stressed workers to challenge onerous working practices;
- (v) **constructivist** for exploring language use and power issues relating to the concept of stress.

As this thesis focuses on field experimentation, a case might be made for solely adopting a post-positivist position such as 'critical realism' (Bhaskar, 1975, 1979). This, however, would be unnecessarily restrictive, as there is no obligation to subscribe to a single doctrine. The natural world contains a vast array of diverse entities amenable to different modes of investigation. As illustrated by Tajfel & Wilkes (1963), the act of categorisation tends to distort perception, accentuating intra-category similarities and inter-category differences. Thus, trying to fit research evidence into a single philosophical framework runs the risk of obscuring rather than illuminating the object of study.

It might be argued, therefore, that this constitutes an 'A-Paradigmatic' stance, i.e., viewing epistemological issues as an unnecessary distraction. This is not the case however. The approach adopted in this thesis has been to start with the various objects of investigation and then draw insights from whichever paradigms appear most relevant. The research, therefore, draws on illustrative principles rather than complete doctrines. The key insights used to frame the research and its interpretation are outlined below. They are grouped under three headings: (1) ontological position, which addresses assumptions regarding the nature of the 'reality' under investigation; (2) causal relations, addressing assumptions about the types of causal inferences that can be drawn; (3) generalizability, which addresses assumptions about possibilities for generalization of research findings.

1. Ontological position

It is assumed that there are both objective, concrete, material realities (independent of human perception) and subjective mentally constructed realities (derived from human perception). However, it is acknowledged that whatever the 'reality' under investigation, there is an inevitable interpretative gap between what exists and the investigator's mental representation of what exists. This is highlighted by Woolgar's (1988) illustration of three ways in which interpretations are limited:

- (i) indexicality – explanations being tied and thus limited to a particular time, place and set of circumstances;
- (ii) inconcludability – always being open to reinterpretation or revision from further evidence;
- (iii) reflexivity – being influenced by the personality, values, beliefs and interests of the individuals designing and interpreting the research.

Thus, the present research can only attempt to offer a partial and provisional explanation of the issues under investigation.

In investigating the effects of interventions (structured communication) on cognition and behaviour, this research programme touches on three contentious topics: (a) the source of meaning; (b) the human capacity for change, i.e., free will versus determinism debate; and (c) the role of consciousness, which is closely related to (b). The aim here is not to debate these complex issues, but simply to indicate the stance adopted in conducting the research.

(a) The source of meaning

Still (2001) highlighted two contrasting approaches to the construction of meaning; 'cognitivism' and 'mutualism'. The first focuses on intra-individual construction, e.g., processes of perception, memory, judgement and decision making. The second focuses on inter-individual construction, e.g., the roles of language and power relations between different individuals and groups within society. This thesis acknowledges that both approaches constitute valid forms of enquiry that can be applied to issues of stress and well-being. The mutualist approach is briefly addressed in Chapter 2, regarding the claimed negative impact of the 'stress discourse'. The main approach, however, is cognitivist, as the present research focuses on tackling stress at an individual rather than societal level.

(b) Free will versus determinism

Though the exercise of choice may be perceived and experienced as 'free will', the assumption adopted in this thesis is that our choices result from complex interactions between innate and acquired predispositions and environmental stimuli. Our responses are therefore not spontaneously chosen by us, but are presumed to emerge from complex processes of excitation and inhibition across vast neural networks, as illustrated by connectionist parallel processing models (e.g., McClelland & Rumelhart, 1985).

The practical implication of this view for the interventions in this thesis is that no single instruction or element can be guaranteed to tip the decisional balance. The

interventions, therefore, incorporate much repetition and multiple triggers designed to cumulatively increase the odds of prompting various behaviours.

(c) The role of consciousness

Phenomena such as subliminal priming (e.g., Bargh, Chen, & Burrows, 1996), blindsight (Weiskrantz, 1996) and experiments appearing to show unconscious processes preceding conscious awareness of making decisions (e.g., Libet, 1985), raise questions about the nature and function of consciousness and its role in guiding behaviour. The interpretation of such phenomena is still subject to debate (e.g., Newell & Shanks, 2014). However, for the purposes of the present research, it is assumed that behaviour is shaped by both conscious and unconscious processes.

The practical implication of this assumption is that behaviour change initiatives are likely to require more than just convincing arguments to sway the opinion of a free-floating, eminently flexible consciousness. They may also need to address other processes (e.g., habitual, impulsive) operating below the threshold of consciousness, presumably deeply rooted in established patterns of neuronal activity. Such processes are addressed from Chapter 5 onwards.

2. Causal relations

As this thesis is based on field research, it is assumed that it is not possible to achieve the precise manipulation and control of variables associated with the positivist approach of the natural sciences. The challenge posed by the complexity of the social world and its underlying mechanisms is illustrated by Bhaskar's (1979) distinction between three 'ontological domains':

- (i) 'the real' – causal mechanisms that exist in the world;
- (ii) 'the actual' – mechanisms that have currently been activated;
- (iii) 'the empirical' – mechanisms that have been activated and observed.

Thus in the field, comprehensive explanations of causation are unlikely. With the ebb and flow of multiple causal factors (both proximal and distal), causal inferences are inevitably less precise and more probabilistic than in laboratory research. Also, though field experimentation in theory offers greater ecological validity, it is still 'unnatural' and may introduce unintended confounds (e.g., demand characteristics: Orne, 1962).

3. Generalizability

Whereas laboratory experimentation, typical of the natural sciences, seeks to offer universal, nomothetic generalizations, the types of inferences that can be drawn from field experimentation are more limited. Findings are more likely to reveal tendencies rather than universal laws.

The practical implication for this thesis is that no single field experiment is likely to yield definitive answers. Mechanisms that may be prominent in one set of circumstances may be less so in another. Consequently, as will be explained in Chapter 6, this thesis does not treat results marginally above the conventional statistical significance threshold (i.e., $p = .05$) as an irrelevance. Results close to statistical significance may be of value and worthy of further investigation in follow-up studies. This is one reason why ease of replication is a valuable feature of the writing interventions used.

1.3.2 Specific research methods

Three main types of data were collected: (1) qualitative; (2) quantitative (self-report measures); (3) quantitative (physiological measures). The specific methods used are briefly outlined below, with more details provided in the relevant chapters:

1. Qualitative data

This was collected through (i) recording of face-to-face interviews with participants (Study 1), (ii) questionnaire feedback to open questions (Studies 2 and 3), and (iii) participants' online writing entries (Studies 2 and 3).

- (i) The interviews were transcribed, systematically coded and subjected to thematic analysis. There are numerous approaches to analysing such data. The method adopted was 'framework analysis' (Ritchie & Spencer, 1994). This is regarded as being more structured and top-down in nature compared to other approaches (e.g., grounded theory: Glaser & Strauss, 1967). It was chosen for two reasons. The first was to try to ensure comprehensive coverage of the broad range of issues and training components included in the pilot intervention. This was important to be able to improve the whole intervention.

The second reason was to save time, as the interviews were not the focus of the whole thesis but just one component of a larger programme. Framework analysis offered the advantage of speed, as key themes were pre-identified. The approach, however, also afforded consideration of bottom-up themes emerging from participant feedback.

It is acknowledged that a predominantly top-down approach is likely to impose more of a researcher's perspective on proceedings. Other approaches and researchers might have elicited different feedback. However, the aim was not to search for anything singular or definitive, but simply to extract practical suggestions for the many ways in which the interventions might be improved.

- (ii) The qualitative feedback from open questions was scanned for insights into participants' experiences of the interventions. Responses were not, however,

subjected to any systematic analysis, as the questions were optional and only completed in detail by a minority of participants.

- (iii) The participant online writing activities in Studies 2 and 3 generated almost a thousand daily writing sessions with numerous entries per session. It was not feasible, therefore, to include a systematic analysis of this amount of qualitative data within the programme of research. The online writing data was therefore used to fulfil two functions. The first was to provide an objective experimental manipulation check, i.e., to verify that participants had performed the required training activities. The second was to investigate the diversity of participant responses to the intervention. This provided insights into individual differences and helped highlight areas of the intervention requiring further improvement. More generally, the participants' writing entries also served as a proof of principle, demonstrating a viable means of generating detailed insights into the learning and application of new coping skills.

2. Quantitative data – self-report measures

This data was principally collected via online questionnaires. The information gathered was used (a) to assess changes in mood states and cognitions relating to well-being (e.g., self-efficacy, perceived progress towards goals) associated with the interventions, and (b) to identify factors (e.g., personality traits) possibly influencing reactions to the interventions.

As discussed in Chapter 2, there are numerous limitations to self-report measures, such as problems of bias and recall. Consequently, the apparent mathematical precision of statistical analyses stemming from such data can be misleading, particularly given the difficulty of control in field experiments and the shifting sands of Bhaskar's (1979) ontological domains. It is acknowledged, therefore, that any results need to be interpreted with caution and viewed as offering only partial, approximate insights into extremely complex and dynamic processes.

3. Quantitative data – biomarker of neuroendocrine activity

Assessing cortisol levels in saliva has been validated as a reliable indicator of levels of activity of the hypothalamic pituitary adrenal (HPA) axis, responsible for cortisol secretion (Pruessner et al., 1997). Two key challenges, particularly for field experimentation, are firstly, ensuring the accuracy of timing of sample collections and secondly, controlling for possible confounding variables that might influence cortisol levels. As will be discussed in Chapter 8, various steps were taken to address these challenges, but they may have been inadequate, as no statistically significant cortisol changes were found.

1.3.3 Ethical considerations

Given the nature of the research, it was expected that many of the participants were likely to be stressed. A prime concern, therefore, was not to overburden them with excessive research demands. Thus, questionnaires were kept as short as possible, which restricted the number of variables investigated. There was also a concern not to push participants too hard if their adherence began to slip. However, non-adherence was not a problem for this particular research programme, as patterns of non-adherence provided useful insights into individual differences and issues requiring further attention.

1.4 Contribution

The research is expected to contribute to knowledge through:

- 1) Development of a functional theoretical framework for more explicit identification and testing of distinctive self-regulatory coping mechanisms.
- 2) Demonstration of an experimental means of inducing and testing the effects of different self-regulatory coping mechanisms in everyday life. The writing paradigm used offers the following advantages:
 - (i) explicit written intervention open to scrutiny by others;
 - (ii) ease of replication and further development by other researchers;
 - (iii) modular structure permitting isolation or combination of different components;
 - (iv) opportunities for both qualitative and quantitative assessment of participant adherence;
 - (v) avoidance of possible confounding effects of social interaction processes associated with expert-led or group-based interventions.
- 3) Development of a prototype for more comprehensive and effective goal-focused / problem-engagement coping.
- 4) Improved understanding of:
 - (i) minimum engagement thresholds required for significant and sustainable improvements in well-being;
 - (ii) advantages and disadvantages of different types of coping mechanism;
 - (iii) person and contextual factors affecting outcomes of coping skills training.

Beyond a direct contribution to the research field, if successfully developed beyond the work outlined in this thesis, the research could provide a platform for more widespread

access to evidence-based self-regulatory skills training, possibly tailored to different personality types and situations. This in turn could contribute to:

1. Public health through:
 - (i) helping to generate a population shift in mental well-being;
 - (ii) helping to prevent the development of stress-related illnesses in healthy populations;
 - (iii) helping to alleviate symptoms and illness progression for people with existing chronic stress-related illnesses;
 - (iv) developing core self-regulatory skills that could help to address a wide range of health-related issues such as reducing weight, increasing physical activity or resisting addictive behaviours.
2. Public finances where health care is funded by the State and private finances where healthcare is funded by the individual.
3. Economic performance through helping to reduce stress-related illness and absenteeism in the work place.
4. The environment through encouraging pursuit of less resource hungry, non-material goals, as advocated for example by self-determination theory (SDT: Ryan & Deci, 2000).

A key point to emphasize is that this research programme is not about developing an 'end', but rather a 'means to an end'. Thus, although the core intervention described in this thesis generated positive results, it is not presented as an end intervention in itself. The purpose is rather to demonstrate the viability of a research tool that can be used collaboratively to build an evidence base for the development of more powerful self-regulatory interventions.

1.5 Thesis structure

The focus of the subsequent chapters is as follows:

Chapter 2 provides the rationale for the present research programme. It does this by highlighting (a) the need for more direct communication of the lessons of academic research to the general public, (b) difficulties in classifying and measuring self-regulatory coping behaviours, and (c) strengths and weaknesses of two contrasting types of self-regulatory intervention and possible advantages of exploring a middle ground between the two.

Chapter 3 draws on a range of literature to establish the design process, structure and content of the initial prototype intervention. It addresses the following 5 process levels:

(a) research process; (b) stress-reduction process; (c) enhancing stress-reduction process; (d) motivation/learning/reinforcement process; and (e) communication/presentation process.

Chapter 4 describes Study 1, the aims of which were to (a) use the format of Pennebaker's writing paradigm to induce an enhanced form of goal-focused coping, (b) assess the impact on self-report measures of psychological well-being, and (c) use participants' feedback to help design an enhanced online version of the training.

Chapter 5 draws on a wider range of literature to address particular challenges for self-regulatory interventions highlighted by Study 1. Three key issues addressed are: (a) problems of artificiality of goal-setting exercises; (b) difficulties in trying to develop critical self-awareness; and (c) difficulties in overcoming maladaptive impulses.

Chapter 6 describes Study 2, the aims of which were to (a) test an online version of the intervention using shorter but more frequent writing sessions compared to Pennebaker's paradigm, (b) assess the nature, timing and duration of any changes in measures of psychological well-being, and (c) use participants' feedback to further enhance the intervention.

Chapter 7 explores ways of further enhancing and testing the intervention. The key issues addressed are: (a) how to encourage greater consistency in the application of self-regulatory techniques; (b) how to enhance performance on variables that registered below average improvements in Study 2; and (c) the design of a contrasting intervention to be used as a control condition for a randomised controlled trial.

Chapter 8 describes Study 3, the aims of which were to (a) test a further enhanced version of the core intervention against a contrasting self-regulatory invention, as part of a randomised controlled trial, (b) assess the effects on measures of psychological well-being, and (c) assess the effects on diurnal cortisol patterns.

Finally, Chapter 9 reviews the research as a whole and discusses possibilities for further development.

CHAPTER 2: LITERATURE REVIEW

This chapter reviews relevant research literature in seeking to justify the focus of this thesis.

Section 2.1 highlights challenges in the understanding and communication of concepts of stress and well-being. The issues cited demonstrate the importance of trying to ensure that the lessons of academic research are applied more effectively in broader society.

Section 2.2 highlights difficulties in conducting research into the use of self-regulatory coping skills. This is used to justify the search for improved methods of exploring the effects of different types of coping.

Section 2.3 reviews strengths and weaknesses of two contrasting types of intervention designed to improve coping skills. The interventions in this thesis seek to exploit a middle ground between the two.

2.1 Relationship between stress, well-being and self-regulation

Stress is a complex construct. In psychological research it is commonly conceptualised in three ways. Stimulus-based models (e.g., Holmes & Rahe, 1967) focus on potential sources of stress in the environment. Response-based models (e.g., Selye, 1956) focus on physiological responses to stress. Transactional or process-based models (e.g., Lazarus & Folkman, 1984) focus on interaction between individuals and their environments, emphasizing the role of cognitive appraisal and coping mechanisms.

These three types of models highlight different routes for alleviating stress. The first, through environmental or social change, e.g., legislation to improve working conditions; the second, through physiological change, e.g., pharmaceutical interventions; the third, through psychological change, e.g., coping skills training. This thesis focuses on psychological change. Though, as highlighted by the biopsychosocial approach to health (Engel, 1977), a comprehensive solution is likely to require the integration of all three.

The dominant model shaping the psychological route is the transactional model developed by Lazarus & Folkman (1984) in their cognitive theory of stress and coping. This defined stress as:

“A particular relationship between the person and the environment that is appraised by the person as taxing or exceeding his or her resources and endangering his or her well-being.” (Lazarus & Folkman, 1984, p. 19)

Thus, the impact of potential stressors is mediated by the person's appraisal and coping mechanisms. Lazarus & Folkman identified three types of appraisal:

1. Primary appraisal – of the stimulus event, which could be categorised as irrelevant, benign-positive or stressful. If the latter, this in turn was sub-categorised into harm/loss (already sustained), threat (anticipated harm/loss) or challenge (possibility of mastery or gain).
2. Secondary appraisal – of the person's capacity to cope with anything deemed 'stressful'. This appraisal involved considering:
 - (i) the coping options available;
 - (ii) the likelihood of coping options achieving desired outcomes (outcome expectancies);
 - (iii) the likelihood of the person being able to successfully execute particular coping options/strategies (efficacy expectation).
3. Reappraisal – based on new information or reinterpretation of original information relating to the environment or the person, i.e., possible repetition of primary and/or secondary appraisal.

This theory suggests that if a person appraises a situation as threatening and likely to exceed his or her coping resources, a stress response will be triggered. The response is multi-faceted and can be categorised under the biopsychosocial headings shown below:

Biological: physiological changes (e.g., autonomic, neuroendocrine, metabolic, cardiovascular, inflammatory and immune responses);

Psychological: changes in affect (e.g., negative emotions such as distress, sadness, anxiety, anger) and cognition (e.g., thoughts about stressors and their consequences, views of self and the environment);

Social: behaviours (e.g., adaptive coping behaviours such as trying to manage stressors or seeking social support).

Lazarus & Folkman (1984) acknowledged many possible types of coping behaviours, but their primary distinction was between problem-focused (addressing the stressor) and emotion-focused (addressing one's emotional response to the stressor). Coping is discussed in more detail in section 2.2.

The key advantage of this model, compared to solely stimulus- or response-based models, is that it offers an explanation of why the same stimulus might produce a stress response in one person and not another.

Together these three ways of viewing stress have underpinned a vast body of research into the relationships between environmental stimuli, appraisal and coping mechanisms, physiological responses and the development of illness. The processes involved are complex and difficult to measure. No single method can address all questions and so a variety of approaches have been used. These include:

- **Laboratory-based psychophysiological stress testing** – principally used to investigate physiological responses to acute stress, e.g., changes in levels of interleukin-6 implicated in the development of coronary artery disease (e.g., von Känel, Kudielka, Preckel, Hanebuth, & Fischer, 2006);
- **Naturalistic monitoring** – used to investigate influences on everyday patterns of key biomarkers of stress such as the hormone cortisol (e.g., Kunz-Ebrecht, Kirschbaum, Marmot, & Steptoe, 2004);
- **Animal testing** – used for longer and more tightly controlled stress experimentation than viable with humans, e.g., to induce diseased states such as atherosclerosis in stressed monkeys (e.g., Manuck, Marsland, Kaplan, & Williams, 1995);
- **Epidemiological studies** – used to identify possible relationships between various biopsychosocial factors and the development of various diseases, e.g., links between work stress and cardiovascular disease (e.g., Kivimäki et al., 2002).

Each method has its strengths and weaknesses, but combined in line with principles of triangulation, they provide useful insights into links between stress and illness, which in turn can be used to inform interventions designed to improve people's health and well-being. This thesis seeks to add to this body of knowledge by helping improve understanding of the links between different types of self-regulatory coping mechanisms, psychological well-being and one aspect of physiology, the stress hormone cortisol.

The reason for focusing on cortisol is that it is strongly implicated in chronic stress, which can have a particularly adverse impact on long-term health. It is controlled by the hypothalamic-pituitary-adrenal (HPA) axis and interacts with every nucleated cell in the body, affecting many physiological processes. For example, it suppresses immune function, increases low density lipoprotein (LDL) cholesterol in the blood, increases deposition of abdominal fat, decalcifies bone, promotes muscle wasting and impairs

reproductive function. Numerous studies have demonstrated links between high cortisol levels and the development of a wide range of illnesses, such as coronary heart disease (Chandola et al., 2008), type 2 diabetes (Björntorp, 2001) and depression (Stetler & Miller, 2011). In the interests of long-term health, therefore, it is important to try to avoid excessive triggering of the HPA axis and cortisol secretion.

Given the established body of research into stress and coping, it would seem sensible to continue to build on this, particularly as interventions based on this research (see section 2.3) have been shown to be effective. However, the whole notion of stress and the value of research into stress have been challenged by some academics in the field of critical social psychology and various branches of sociology. To ensure that the present research programme proceeds in the most effective way, it is important to consider such criticisms.

Many of the criticisms have focused on work stress, particularly relevant to this thesis, and can be grouped under four main headings:

1. **Stress concept:** Critics (e.g., Pollock, 1988; Wainwright & Calnan, 2012) contend that there is no clear definition or consensus as to what constitutes stress. They argue that the term is ambiguous, overused and hinders understanding of underlying problems that people face.
2. **Stress-illness link:** Citing epidemiological studies linking environmental stressors (e.g., job strain) to illness (e.g., coronary heart disease), Wainwright & Calnan (2012), for example, argue that research into work stress is methodologically flawed (e.g., through limitations of subjective self-report data used to assess job strain) and over-simplistic in that it suggests a deterministic mono-causal relationship between stress and illness.
3. **Person-environment relationship:** Critics further argue that the stress discourse disempowers individuals:
 - (i) by presenting stress as inevitable, a product of the increasing complexity and pace of change in modern industrialised societies, which they claim is not supported by fact (e.g., Pollock, 1988; Wainwright & Calnan, 2012);
 - (ii) by treating work place problems as medical issues, e.g., failure of individual resilience and coping to be addressed by drugs and therapy, rather than management or power issues to be addressed by negotiation or industrial action (e.g., Newton, 1995; Harkness et al. 2005; Wainwright & Calnan, 2012).
4. **Stress management:** Critics such as Patmore (2006) argue that the stress discourse has spawned a multi-billion pound stress-management industry

promoting a confusing array of unproven therapies, gadgets and interventions that rather than helping, only serve to exacerbate problems by, for example, soothing and mollifying workers into avoidant relaxation rather than challenging bad working practices and conditions that may be the true source of the problem.

On the basis of such criticisms, Harris, Daniels, & Briner (2004, p. 223), for example, call for “*a fundamental reappraisal rather than incremental development of work stress and coping theory*”. Wainwright & Calnan (2012, p. 181) are even more critical, describing further exploration of work stress as a “*fool’s errand*”, advocating an epistemological shift away from positivism to interpretivism (related to ‘constructivism’ – see section 1.3.1), and focusing on well-being rather than stress.

In contrast to these claims, this thesis seeks to demonstrate that research into stress can not only continue to make a contribution to enhancing human well-being, but arguably can make an even greater contribution with some relatively minor methodological improvements and shifts in emphasis. As will be explained below, three of the four criticisms raised relate not to the research itself but to its interpretation and application in broader society. This is an issue of communication beyond academia. The one direct criticism of the research itself (point 2), which challenges findings of links between stress and illness, appears to rest on a narrow interpretation of just one of several types of research evidence. This again can be viewed as highlighting a need for better communication by researchers in this field.

The criticisms raised are addressed in order:

1. **Stress concept:** Amongst academic psychologists, there is arguably no lack of consensus about the definition of stress, as demonstrated by health psychology textbooks (e.g., Ogden, 2012; Sarafino, 2008) consistently citing the three standard ways of conceptualising stress outlined at the beginning of this chapter. However, given the subjective nature of individual appraisal of stress, it is not surprising if there is a lack of consensus in broader society as to what constitutes stress. The same could be said of other constructs such as ‘happiness’ or ‘depression’. This is no reason, however, to abandon such terms, but rather to increase efforts to improve understanding.
2. **Stress-illness link:** Wainwright & Calnan’s (2012) claim that research into work stress presents an overly deterministic, positivist mono-causal relationship between stress and illness can be countered in a number of ways:
 - (i) Their challenge to the existence of a stress-illness link principally rests on citing acknowledged methodological limitations (e.g., Kasl, 1978) of just one type of

research, i.e., epidemiological studies. No mention is made of the value of triangulation with other types of research methods listed above.

- (ii) Their challenge also rests on criticising models of work stress (e.g., Demand-Control Model, Karasek & Theorell, 1990; Effort-Reward Imbalance Model, Siegrist, 1996) as overly deterministic in ignoring the role of subjective appraisal. They fail to mention, however, that the most influential model in the study of stress (Lazarus & Folkman, 1984), already described above, has subjective appraisal at its very core.
- (iii) They further characterise research into work stress as a remnant of positivism and biological reductionism, incapable of addressing the role of human consciousness and subjectivity, and propose interpretivism as the only alternative. No mention is made of a post-positivist middle ground (see section 1.3.1), e.g., the critical realist stance incorporating Bhaskar's (1979) differing 'ontological domains', which acknowledges that we can only gain approximate, probabilistic understanding of the multiple complex causal mechanisms operating in the human social world. Such criticisms again highlight the need for researchers investigating stress to ensure better communication and interpretation of research findings. Epidemiological studies such as Kivimäki et al. (2002) simply highlight risk factors and probabilities. Their findings do not, for example, imply that anyone subject to work strain will automatically die of cardiovascular disease.

3. **Person-environment relationship:** Lazarus and Folkman's (1984) representation of stress as stemming from a poor person-environment fit, does not make any pronouncements on social trends or power imbalances, nor does it prescribe where adjustment for any mismatch should be made. If individuals are disempowered by the stress discourse, as is claimed, this is arguably more an emergent property of diverse societal forces and viewpoints than a problem with stress theory. If the theory has been applied in a way that disadvantages individuals, there is a case for arguing that researchers should engage more in public debate to try to correct this, i.e., promoting empowerment rather than disempowerment.

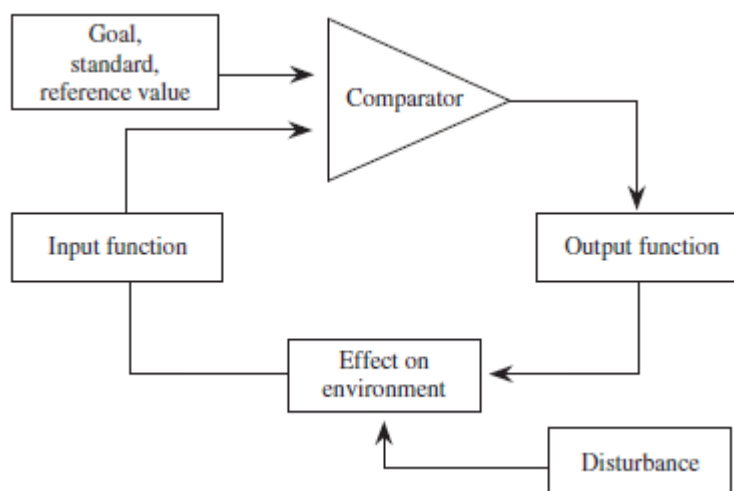
4. **Stress management:** Criticism of the vast array of unproven therapies and techniques available in the market place is arguably more an indictment of unregulated capitalism than stress research. Again, however, this highlights the need for academic researchers to play a greater role in shaping the kinds of stress-management and well-being interventions that are applied in broader society, e.g., by encouraging more widespread use of evidence-based interventions.

None of the criticisms cited above seriously challenge the core science underpinning academic research into stress. This should be relatively robust, as published research should already have passed critical peer review. The criticisms do, however, highlight possible failings or at the very least missed opportunities in the application of research findings in broader society.

A core aim of this thesis, therefore, as highlighted in section 1.1, is to help focus attention on the most valuable insights from stress, well-being and other related research, and to communicate this more effectively to the public. A key question is how best to frame such information. As cited above, Wainwright & Calnan (2012) advocated switching the focus from ‘stress’ to ‘well-being’. This mirrors a broader trend within psychology, i.e., moving beyond just correcting negative states to inducing positive states, as illustrated by the emergence of ‘positive psychology’ (e.g., Seligman, 2002). This is also echoed in the WHO’s definition of health as “*a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity*” (Mackenzie, 1946, p. 428). However, as Wainwright & Calnan (2012) acknowledge, what constitutes ‘well-being’ for one person may not apply to another. Thus, the term is potentially just as vague, subjective and open to misinterpretation as ‘stress’.

A deeper level of explanation is therefore required, ideally one that encompasses both stress and well-being and can account for individual differences in how these are appraised. Such an explanation is possible using Scheier & Carver’s (2003) model of behavioural self-regulation. This model stems from control theory (Carver & Scheier, 1981) and is based on the feedback loop shown in Figure 2.1 below.

Figure 2.1 The feedback loop (from Rasmussen, Wrosch, Scheier, & Carver, 2006)



As highlighted by MacKenzie, Mezo, & Francis (2012), this feedback loop underpins a wide range of self-regulatory theories. It originated from cybernetic theory (Wiener, 1948), which sought to explain self-regulating machine control systems and was

subsequently applied to human behaviour (Miller, Galanter, & Pribrum, 1960; Powers, 1973). The core model consists of four components; an input function, a reference value, a comparator and an output function. When applied to human behaviour, the input function equates to perception of one's current situation. The reference value equates to one's goals. The comparator is the process of comparing one's current situation to one's desired situation (i.e., goals). The output function represents the behaviour or action taken to address any perceived discrepancy between current and desired states.

Carver & Scheier (1990) also highlighted a second, parallel feedback process, involving feelings or affect generated by the comparison process. Perceived progress towards goals generates positive feedback in the form of positive affect. Inadequate progress or threat to goals generates negative feedback in the form of negative affect. This affective feedback and the associated appraisals of goal progress guide ongoing behaviour and inform perceptions of subjective wellbeing.

Thus based on this model, 'well-being' is associated with positive appraisals of goal progress and parallel positive affect, whereas 'stress' is associated with negative appraisals and negative affect. Although the model offers an explanation of the mechanics of stress and well-being, it does not specify particular thresholds for triggering stress responses or perceptions of 'well-being', which will no doubt vary from individual to individual. However, this is arguably not the key question. Whatever someone's level of stress or well-being, it is reasonable to assume that most people would want to reduce their stress and increase their well-being. The key question, therefore, becomes how to achieve this, which is where self-regulatory theory comes to the fore. The greater one's self-regulatory knowledge and skill, the greater the capacity to reduce discrepancies between actual and desired goal states (alleviating stress) and enhance progress towards goals (improving well-being).

This thesis, therefore, advocates focusing attention more on the process (self-regulation) than the problem (stress) or the ultimate aim (well-being). Such an approach is supported by Taylor, Pham, Rivkin, & Armor's (1998) finding that focusing on the 'process' can be more conducive to success than focusing on 'outcomes'.

Self-regulation, however, is complex in that it involves many component processes such as "*goal selection; goal cognition; directional maintenance; directional change or reprioritisation; and goal termination*" (Karoly, 1993, p. 25). Also, human beings are far more complex than the mechanical systems on which control theory is modelled. Thus, there is much to impart and even more still to learn. It is a huge challenge illustrated by Karoly's (1993, p. 26) observation that:

“No research program has ever tackled the entire sequence from goal choice to goal attainment for obvious practical reasons and because the component processes tend to be indexable at different levels, nonrecursive, and difficult to identify in vivo. However, an unfortunate consequence of the artificial (but artful) parsing of a complex, contextually embedded stream of events is the tendency for mechanisms to be analysed singly (overlooking possible compound effects), via unique paradigmatic renderings, in relation to only a subset of potential outcomes, and with regard to but a portion of the complete regulatory cycle.”

This thesis seeks to address this complexity in two ways. The first is by demonstrating how ‘component processes’ might be investigated ‘in vivo’, using an adaptation of Pennebaker’s experimental writing paradigm. This is explained in section 2.3.2. The second is by attempting to tackle the entire sequence from goal choice to goal attainment, albeit in a rudimentary way.

To recap this section has highlighted:

1. The need to improve communication of research findings to the general public to overcome misunderstandings about stress.
2. The possibility of focusing on processes (self-regulation) rather than outcomes (stress or well-being) as a pragmatic route to improving well-being.
3. The difficulty of researching such processes in a comprehensive way.

To be able to develop self-regulatory skills and test their effects, it is important to be able to clearly specify and assess the behaviours involved. The next section addresses key challenges relating to the classification and measurement of such behaviours.

2.2 Assessment of self-regulatory coping behaviours

Lazarus & Folkman (1984) defined coping as:

“Constantly changing cognitive and behavioural efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person” (p. 141).

There is considerable overlap between ‘coping behaviours’ and ‘self-regulatory behaviours’, and the challenges of classification and measurement are similar for both. The two most important differences of relevance to this thesis are:

1. Self-regulation is framed more broadly in that it refers to the pursuit of any goal, not just the goal of reducing stress.
2. Lazarus & Folkman’s (1984) definition of ‘coping’ focused on deliberative purposeful behaviours and excluded instinctive reactions and automated

responses. Karoly's (1993) definition (see section 1.1) of self-regulation, however, included automated behaviours.

This thesis aims for the more comprehensive approach, i.e., focusing on goal pursuit in general and addressing both automated and purposeful/deliberate behaviours. Though the discussion of taxonomies and measurement in this section is principally based on stress and coping literature, the principles still apply to the broader range of behaviours (referred to in this thesis as 'self-regulatory coping behaviours').

Commenting on various challenges of coping research, Lazarus & Folkman (1984) acknowledged that the distinction between deliberative responses (i.e., their definition of 'coping') and automated responses is not always clear. They reasoned that when demands taxed or exceeded resources, effortful/deliberative responses (i.e., their definition of coping) would be required. Focusing on intentional behaviours should in theory render 'coping' amenable to self-report. However, the absence of a clear dividing line between deliberate and automated behaviours raises questions about just how much coping behaviour can be captured in practice in any self-report measurement.

Further challenges in the assessment of self-regulatory coping behaviours include:

1. The fact that cognitive aspects of coping cannot be directly observed.
2. That coping is not a stable trait. As noted by Lazarus (1993), though some behaviours may be relatively consistent across situations (e.g., positive reappraisal) and treated as a 'coping style', others (e.g., seeking social support) are more inconsistent, influenced by temporal and contextual factors and thus are better viewed as a 'process'. Furthermore, such processes can be very complex, involving different combinations and sequences of behaviours at different stages of dealing with a stressor.
3. That in principle no coping behaviour can be described as universally good or bad. It is a question of fit between the behaviour and the context and the goals of the person involved (Forsythe & Compas, 1987; Lazarus, 1993). Also, it is difficult to assess the effectiveness of a particular coping strategy, as for some problems, resolution may not be feasible, only differing degrees of compromise.

Coping is therefore extremely complex, dynamic and difficult to assess. It also covers a vast array of cognitions and behaviours, which researchers have made numerous attempts to catalogue and classify. A review by Skinner, Edge, Altman, & Sherwood (2003) identified more than 400 types of coping behaviour. These have been categorised in various ways, ranging from basic dichotomies such as 'problem- versus

emotion-focused' (Folkman & Lazarus, 1980) and 'approach versus avoidance' (Roth & Cohen, 1986) to multiple families of coping (Skinner et al., 2003; see Appendix A).

A robust classification system is important, not only for research but also for imparting knowledge and skills in a clear and concise way. However, even the basic dichotomies are far from clear-cut. For example, Lazarus & Folkman's (1984) distinction between problem- and emotion-focused coping breaks down in practice, as many behaviours can impact both. Larsen & Prizmic (2004), for example, identified ten emotion-focused coping strategies for reducing negative affect:

1. Distraction
2. Suppression of the emotion
3. Venting/expressing emotion
4. Cognitive reappraisal, i.e., thinking about the problem in a different way
5. Downward social comparison (comparing oneself to others worse off)
6. Problem-directed action
7. Self-reward
8. Physical manipulations, e.g., exercise
9. Socialising
10. Withdrawal from the problem situation

However, item 6 is explicitly problem-focused and other strategies listed could also be used in problem-focused ways. Item 2, for example, could be useful when trying to resolve an emotionally charged problem. Items 3 and 9 could be used to enlist social support in overcoming a problem. Item 4 could be used for creative problem solving.

A further problem with this distinction is that it is based on the notion of controllability, i.e., problem-focused coping where stressors are controllable and emotion-focused coping where they are not. However, judgements of controllability are subjective and heavily influenced by the frame of reference. Person A, for example, might view the problem of a volatile boss as uncontrollable. Person B, however, taking a broader perspective, might view this as controllable through, e.g., changing jobs (item 10 from the list above).

A further challenge for classification is the question of balance, as the way that information is framed can influence behaviour. For example, a danger inherent in the problem-focused versus emotion-focused dichotomy is that it could be interpreted as implying equal value or weighting for the two types of strategy. This could fast track person A down the uncontrollable stressor / emotion-focused route, when the better option might be to persevere with the problem-focused route to find possibilities for

control. [N.B. This issue of balance is further explored in relation to Gross' (1998) model of emotion regulation in Chapter 3.]

The 'approach versus avoidance' dichotomy offers a clearer separation of behaviours. For training purposes, it would clearly be useful to identify the most adaptive coping behaviours and various meta-analytic reviews have sought to address this. However, Bonanno & Burton (2013) suggest this is an erroneous path based on what they term the 'fallacy of uniform efficacy', as no coping behaviour is universally good or bad, but rather depends on the person-environment fit, as argued by Lazarus & Folkman (1984). Nevertheless, though it may be correct that there are no universal laws applicable to coping behaviours, identifying tendencies and probabilities (i.e., the currency of the post-positivist paradigm referred to in Chapter 1) can still be useful, as given appropriate caveats, they can help guide people towards more adaptive behaviours.

A meta-analysis of 43 studies by Suls & Fletcher (1985) is often cited as demonstrating that avoidant coping may be more adaptive in the short term and approach (or attention) more adaptive in the long term. However, the short-term studies reviewed were predominantly pain-based laboratory experiments and so the findings may not necessarily apply to other contexts, e.g., more naturalistic stressors and settings.

Research focusing on specific domains may offer more reliable interpretations. An example is a meta-analytic review by Roesch et al. (2005) of 33 predominantly cross-sectional studies of men coping with prostate cancer. This particular review also demonstrates the importance of the choice of classification system. Sorting coping behaviours according to approach versus avoidance produced a clearer differentiation of outcomes than problem- versus emotion-focused. Approach coping was associated with distinctly positive outcomes and avoidance coping with negative; whereas the differences between problem- and emotion-focused coping behaviours were less distinctive, with both associated with positive outcomes, though with weaker effect sizes than approach coping.

The importance of classification is further illustrated in a meta-analysis by Duangdao & Roesch (2008) of 21 studies of adults coping with diabetes. This found that overall adjustment was positively associated with approach and problem-focused coping, but found no relationship with avoidance or emotion-focused coping. However, when emotion-focused coping was subdivided into approach- and avoidance-oriented emotion-focused coping, a positive association with overall adjustment was found for approach-oriented emotion-focused coping.

The higher order dichotomies of approach versus avoidance and problem- versus emotion-focused coping are clearly very basic distinctions. In their place Skinner et al. (2003) proposed their families of coping taxonomy (Appendix A) as a platform for future research. This offered a more elaborate higher order structure linked to adaptive functions. Skinner et al. (2003), however, acknowledged uncertainty over how such higher order categories could best be organised and called for more analysis of the adaptive functions of higher order categories *“coupled with studies focused on their functional homogeneity and distinctiveness”* (p. 248). Though a more elaborate and robust higher order structure would clearly be useful, Skinner et al.’s (2003) taxonomy has not been used for this thesis due to the following perceived limitations:

1. Their taxonomy links families of coping to particular functions within higher order groupings of three adaptive processes:
 - (i) coordinating actions and contingencies in the environment;
 - (ii) coordinating reliance and social resources available;
 - (iii) coordinating preferences and available options.

Though these three processes may represent different functions, they are not as fundamentally distinctive, in a self-regulatory sense as, for example, ‘approach versus avoidance’ or even ‘problem- versus emotion-focused’ and are therefore less likely to generate meaningful distinctions of practical use in the real world. For example, ‘problem solving’ allocated to process 1, ‘support seeking’ from process 2 and ‘negotiation’ from process 3 could all be classified under a ‘problem-focused’ approach.

2. Even some lower order families of coping groupings are problematic. For example, the ‘accommodation’ family includes both ‘distraction’ and ‘cognitive restructuring’. The justification offered is that *“both can be considered active attempts to redirect attention and experience away from the stressful features of a transaction and toward a positive target”* (Skinner et al., 2003, p. 246). This recognises a similarity, but ignores an important difference, namely that ‘cognitive restructuring’ can be considered approach/attention oriented and ‘distraction’, avoidance oriented. Skinner et al. (2003) acknowledge the difficulty in definitively classifying ‘cognitive restructuring’ as well as other key constructs such as ‘emotion regulation’ and ‘seeking social support’. Such difficulties suggest a need for more robust organising principles for their classification system.
3. Their taxonomy simply lists families of coping and attempts to organise them into higher order adaptive processes. There is no clear differentiation, however, as to

their relative adaptiveness and whether, for example, they might have different consequences for psychological or physiological outcomes.

An alternative higher order grouping is therefore proposed in Chapter 3

The method of coping measurement can also have an important influence on results. Stanton & Low (2012), for example, argued that one of the reasons why emotion-focused coping was often (wrongly in their view) associated with maladaptive outcomes has been due to a confounding overlap between self-report measurement scales, with for example emotion-focused coping scales sharing similar items to anxiety and distress scales.

Self-report measurement scales or inventories have been the predominant means to date of investigating coping behaviours, e.g., Ways of coping checklist (Folkman & Lazarus, 1988) and COPE (Carver, Scheier, & Weintraub, 1989). Although they offer advantages in terms of the broad range of cognitions and behaviours covered and facilitate comparison across individuals, they have numerous limitations, as highlighted for example by Folkman & Moskowitz (2004). These include:

- Relatively burdensome for participants in terms of length, e.g., 60 questions in the COPE (Carver et al., 1989).
- Problems of recall accuracy, e.g., as illustrated by Kahneman & Riis' (2005) distinction between the 'experiencing self' and 'remembering and evaluating self'.
- Possible retrospective bias, e.g., reports of coping influenced by outcomes.
- Influence of social desirability, e.g., possible under reporting of maladaptive behaviours that might be frowned upon.
- Subjective and possibly erroneous labelling of behaviour, e.g., what one person views as 'constructive thinking' might be considered 'rumination' by another.
- The inventories refer to broad categories of behaviour such as 'planning', but offer no depth of analysis within categories. For example, they offer no insight into differing levels of sophistication or effectiveness in how activities are performed. This is particularly important when trying to teach self-regulatory skills.

Various methods have been used to try to address some of these problems. For example:

- shorter recall periods, e.g., reporting at the end of each day, e.g., Stone & Neale's (1984) Daily Coping Inventory;
- real-time ecological momentary assessment, e.g., Stone et al. (1998);
- diary studies, e.g., Steptoe, Lipsey, & Wardle (1998);

- narrative approaches, e.g., Folkman (1997).

Each has its relative strengths and weaknesses. A common limitation, however, is that they all rely on indirect reports rather than direct use of coping techniques, which could possibly lead to erroneous conclusions. For example, using items from the COPE inventory, O'Donnell, Badrick, Kumari, & Steptoe (2008) found that 'problem engagement' and 'seeking social support' coping styles were associated with lower overall daily levels of the stress hormone cortisol. This might be interpreted as suggesting that such coping styles help reduce cortisol levels. However, as correlation is not proof of causation, the lower cortisol could stem from other factors possibly associated with the coping styles, such as self-efficacy or certain personality traits. If so, such coping styles might be inappropriate for people not sharing such traits.

To try to gain more reliable direct insights, this thesis focuses on experimentally inducing and testing actual behaviours rather than relying on indirect self-report evidence. The next section, therefore, reviews experimental studies that have been particularly successful in using self-regulatory coping techniques to reduce stress and enhance psychological and physical well-being.

To recap section 2.2:

1. Coping is complex and difficult to classify and measure.
2. Context, classification and measurement need to be considered very carefully as they shape the conclusions that can be drawn from research.
3. The predominant method of measurement, self-report inventories, identify broad categories of behaviour, but offer little insight into the depth or skill with which they are applied.
4. Taxonomies struggle to usefully organise the many hundreds of coping behaviours in conceptually robust ways, particularly in terms of higher order categories.

2.3 Interventions

There is an extensive literature covering interventions in many fields that could conceivably help improve self-regulatory skills to enhance well-being and better cope with stress. This section focuses on two bodies of research that are most relevant to this thesis:

1. Cognitive-behavioural stress-management (CBSM) interventions
2. Interventions based on Pennebaker's emotional disclosure experimental writing paradigm

It will be argued that:

- (i) Though CBSM interventions have demonstrated both psychological and physiological benefits, they lack precision, experimental control and are inefficient in terms of resource use.
- (ii) Pennebaker's experimental writing paradigm offers a method for greater precision, control and efficiency, but has been predominantly applied to a single coping mechanism with relatively limited potential.
- (iii) Adapting and applying Pennebaker's paradigm to a much broader range and depth of self-regulatory coping mechanisms could lead to more detailed insights and more effective interventions.

2.3.1 Cognitive-behavioural stress-management interventions

Stress management is a widely used term encompassing many different types of intervention. A search of the PsychINFO and PsycARTICLES databases (14.01.14) showed 11,029 articles published in peer reviewed journals between 1958 and 2014 on various aspects of 'stress management'. Examples of interventions associated with stress management include anger management, assertiveness training, biofeedback, cognitive restructuring, goal setting, guided imagery, massage, meditation, problem solving, progressive muscle relaxation, social-skills training and time management. Stress-management interventions can also include general education about diet, exercise, health and well-being.

To distinguish stress management from other types of intervention, Kenny (2007, p. 403) identified the following as key characteristics:

1. generally applied to adequately functioning individuals facing difficult circumstances;
2. focus primarily educational rather than psychotherapeutic;
3. short rather than long duration, e.g., fixed number of sessions;
4. generally directed at groups rather than individuals.

The particular type of stress-management intervention highlighted in this section is 'cognitive-behavioural stress management'. It has been chosen for two reasons, which will be expanded upon below. The first is that cognitive-behavioural interventions are the most relevant to stress and coping theory and the self-regulatory processes addressed in this thesis. The second is that research suggests that they are among the most effective mechanisms tested to date and hence provide a strong platform for further development.

In relation to the first point, Lazarus & Folkman (1984) highlighted cognitive-behavioural approaches (e.g., Beck, 1976; Ellis, 1962, 1975) as being particularly

compatible with their stress and coping theory. Less compatible approaches cited were biological/physiological, psychodynamic and behavioural in the sense of conditioning or deconditioning. A particular challenge they noted for stress management (i.e., training groups as opposed to one-on-one treatments) was the relative inflexibility of generic training in that it failed to take account of individual differences or concerns. This criticism will be addressed at various points throughout this thesis, as it constitutes a key issue.

In relation to the second point, meta-analyses of workplace interventions (the focus of this thesis) have highlighted cognitive-behavioural interventions as the most effective. For example, a meta-analysis of 48 occupational stress-reducing interventions between 1977 and 1996, by van der Klink, Blonk, Schene, & van Dijk (2001), found 'cognitive-behavioural' interventions to have the strongest average effect size (Cohen's d of 0.68: Cohen, 1988), followed by 'multimodal' ($d = 0.51$) and 'relaxation' ($d = 0.35$). A fourth category, 'organisational', which referred to initiatives such as increasing job control or participation in decision making, had no significant effect.

A follow-up meta-analysis by Richardson & Rothstein (2008) of 55 interventions again found cognitive-behavioural to be the strongest intervention type ($d = 1.164$). The average effect size was much higher than in the van der Klink et al. (2001) study, which Richardson & Rothstein attributed to focusing on interventions with tighter experimental designs. The 2001 study, for example, had included quasi-experimental designs. The average effect size for relaxation interventions in the 2008 study was also higher ($d = 0.497$).

Further findings of the Richardson & Rothstein (2008) meta-analysis relevant to this thesis include:

- Multimodal interventions that combined cognitive-behavioural with other techniques (e.g., relaxation, assertiveness, time management) appeared to be much less effective ($d = 0.239$) than cognitive-behavioural alone ($d = 1.164$). Richardson & Rothstein (2008) suggested this might be because cognitive-behavioural interventions are relatively complex and multifaceted, and adding in a mixture of other techniques may dilute rather than enhance their impact. This interpretation is supported by the fact that the impact of relaxation techniques, which are simpler to teach, was not diminished to the same degree when combined with other components.
- Though not the most effective, multimodal interventions were the most common (19 out of 55), particularly in office settings. Richardson & Rothstein (2008) described them as a "potpourri", more of a scattergun approach than evidence-based.

- Multimodal interventions also tended to be the longest interventions and their effectiveness declined as treatment length increased. This may again be related to some kind of dilution effect.
- Only 15 out of 55 interventions included any follow-up assessment beyond the post-treatment evaluation and most were only a few weeks later. Consequently, there is a lack of evidence on the durability of effects.
- There was considerable heterogeneity within the cognitive-behavioural category. Richardson & Rothstein attributed this partly to the variety of occupational settings and partly to differences in the interventions. The latter highlights the potential value of testing specific subsets of cognitive-behavioural techniques to see if some are more effective than others.
- The effect sizes reported were averages for the range of outcome measures assessed in each study. For cognitive-behavioural interventions the outcome measures were principally psychological. No single-mode cognitive-behavioural intervention included physiological assessment. Thus, the physiological potential of such workplace interventions was unclear.

Although these two meta-analyses provide some insights into the relative effectiveness of different types of stress-management intervention, it is difficult to draw reliable conclusions about specific effect sizes, as the figures generated for each study were averages of a diverse range of measures. Effect sizes calculated on a narrower range of measures may offer more reliable estimates. For example, a meta-analysis by Van Daele, Hermans, Van Audenhove, & Van den Bergh (2012) calculated effect sizes for a single type of self-report measure, 'perceived stress', in a review of 19 stress-management interventions between 1990 and 2010. The average treatment effect size, calculated using Hedge's *g* (a bias corrected version of Cohen's *d*), was 0.27 posttest and 0.20 at subsequent follow-up (six months on average).

A finding that was consistent with Richardson & Rothstein (2008) was that shorter interventions appeared to be more effective, i.e., intervention duration was negatively correlated with posttest effect size. The authors did not offer an explanation, but again this might be attributable to some kind of dilution effect. A further finding was that the effect size at follow-up was negatively correlated with the length of follow-up, which raises questions about the sustainability of intervention effects. However, the authors suggested the small number of studies with follow-ups (nine) and the limited variance in follow-up timing across studies made it difficult to draw reliable conclusions.

None of the meta-analyses cited thus far provide much insight into physiological effects of CBSM interventions. However, this has been more closely addressed by research in

medical settings, for example, in helping patients coping with life threatening diseases such as cancer and HIV. Meta-analyses have tended to report no significant overall effects for physiological outcomes, e.g., Meyer & Mark (1995) and Ledesma & Kumano (2009) in the case of cancer patients and, e.g., Scott-Sheldon, Kalichman, Carey, & Fielder (2008) and Crepaz et al. (2008) in relation to HIV patients. However, individual studies have provided some insights into what may be possible. A leading researcher in this field, for example, is Professor Michael Antoni at the University of Miami. His team have researched the psychological and physiological effects of CBSM interventions on a variety of patient groups.

With breast cancer patients, for example, a randomised controlled trial by Phillips et al. (2008) found that a ten week CBSM training programme resulted in significantly greater reductions in serum cortisol levels over twelve months compared to a control group who attended a one day psychoeducation seminar (Cohen's $d = 0.20$).

With HIV patients, a study by Antoni et al. (2000) reported a significant reduction in urinary cortisol levels, $F(1, 33) = 5.32, p < .03$, at the end of a 10 week CBSM intervention, compared to no significant change in controls, $F(1, 12) = .39, p > .50$. The CBSM participants also showed significant reductions in anxiety, depression, anger, and confusion. The Antoni research group have also demonstrated significant effects of CBSM interventions on various indicators of immune function, e.g., T lymphocyte cell counts (e.g., Antoni et al., 2002) and cytokine production (e.g., Antoni et al., 2009).

Such studies suggest that CBSM interventions can impact physiological as well as psychological measures. However, as indicated by the various meta-analyses cited above, physiological effects are much more difficult to demonstrate. Studies by the Antoni research group were extremely well resourced and were able to control for many possible confounds. Their training also required considerable time and resources, i.e., ten weekly two hour group sessions of up to nine participants supervised by two facilitators, plus homework for participants between sessions. The training was also multimodal, covering a broad range of coping techniques, which included cognitive restructuring, assertiveness training, anger management, social support utilization skills and various relaxation techniques such as progressive muscle relaxation, meditation, abdominal breathing and guided imagery. The multiplicity of techniques makes it difficult to identify the source of any subsequent health benefits, a problem frequently reiterated in reviews (e.g., Brown & Venable, 2008). As highlighted by Richardson & Rothstein (2008), it is also possible that this multiplicity of techniques may dilute the overall impact of the most useful elements of the training.

A further problem with such group-based and expert-led interventions is that some of the benefits may stem from the social support and interaction involved rather than coping techniques. This could be from other group members, e.g., bonding with people facing the same life threatening condition. Alternatively, it could stem from the relationship with the facilitator(s). A review of the effectiveness of cognitive therapy by Waddington (2002) highlighted the potentially decisive impact of the therapeutic relationship on outcomes. Thus, even though the Antoni group interventions, for example, are well specified with published manuals (e.g., Antoni, 2003), the interpersonal interaction is unique to each situation and hence difficult to control and replicate.

Web-based interventions without any person-to-person therapeutic interaction are more amenable to experimental control and replication, but often the details are not provided. Descriptions tend to be limited to the topics and skills covered in the various training modules. Typical examples include: Shimazu, Kawakami, Irimajiri, Sakamoto, & Amano (2005) for problem solving, Eisen, Allen, Bollash, & Pescatello (2008) for stress management and Geraedts, Kleiboer, Wiezer, van Mechelen, & Cuijpers (2013) for treating depression. A review by Griffiths & Christensen (2006) of Internet-based RCTs for mental disorders and related conditions including stress, reported that only about a quarter of the interventions reviewed were publicly available. The most commonly available were CBT interventions for depression, such as MoodGYM (Christensen, Griffiths, & Groves, 2004) and Beating the Blues (BTB; Proudfoot et al., 2004). Such interventions are relatively well established and often replicated, but there is still room for further improvement. A recent meta-analysis of computer-based treatments for depression by Richards & Richardson (2012), for example, found just a medium overall effect size ($d = 0.56$) for reducing depression and very high dropout, i.e., 74% for non-support and 38.4% for administrative support.

Dropout is also an issue for many web-based stress interventions, along with difficulties translating the skills outlined into regular daily practice (e.g., Eisen et al., 2008). Furthermore, given that self-regulation encompasses more than stress reduction or CBT and that human beings are so diverse, there is still much to learn to be able to create viable standalone self-regulatory interventions that adequately address the needs of all participants. Ideally, therefore, interventions used in research should be fully open to scrutiny and amenable to continual improvement, with insights from as many sources of expertise as possible.

To summarize this section:

1. CBSM interventions designed to enhance adaptive psychological coping skills appear to be able to generate improvements in a wide range of psychological measures in numerous of settings.
2. CBSM interventions also appear to be able to generate improvements in some aspects of physiology, but these tend to be more difficult to demonstrate.
3. Cognitive-behavioural interventions are often very complex and it is unclear which aspects of training are most beneficial.
4. More precision and experimental control is required to help pinpoint and amplify the key mechanisms.
5. Interventions should ideally be fully specified and open to continual improvement, e.g., to reduce attrition and to better integrate best practices into daily lives.

The next section highlights a research method that could help address some of these issues.

2.3.2 Pennebaker's experimental writing paradigm

The method in question is an experimental writing procedure originally devised by Pennebaker & Beall (1986) to test the effects of emotional disclosure or expression on various aspects of health. The standard procedure requires participants to write about their deepest thoughts and feelings concerning a particularly stressful or traumatic event. Writing sessions typically last 20 minutes and are usually repeated three to four times in total, across consecutive days or weeks. Various pre- and post-intervention measures are compared to controls instructed to write about mundane or neutral topics.

Pennebaker & Beall's (1986) original study was conducted with students and found that written emotional disclosure/expression resulted in higher blood pressure and negative affect at the time of writing, but fewer health centre visits in the six months following the experiment. It has since spawned hundreds of further studies exploring the impact of written emotional disclosure/expression on a wide array of psychological and physiological outcomes. Psychological outcomes, for example, include: reduced depressive symptoms (Epstein, Sloan, & Marx, 2005); reduced perceptions of stress (Nandagopal, 2008). Physiological outcomes include: improved immune function (Pennebaker, Kiecolt-Glaser, & Glaser, 1988); enhanced wound healing (Weinman, Ebrecht, Scott, Walburn, & Dyson, 2008). Self-reported physical outcomes include: reduced upper respiratory symptoms (Greenberg, Wortman, & Stone, 1996); reduced cancer-related physical symptoms (Low, Stanton, & Danoff-Burg, 2006).

Studies, however, have produced mixed results and the overall impact of written emotional disclosure/expression is unclear. A meta-analysis by Smyth (1998) of 13

RCTs involving psychologically and physically healthy adults (mainly students) found that written emotional disclosure/expression was associated with significant improvements in reported physical health, psychological well-being, physiological functioning, and general functioning. The largest mean effect sizes, calculated using fixed effect analysis, were for physiological functioning ($d = 0.681$, $p < .001$; $r = .322$) and psychological well-being ($d = 0.661$; $p < .001$; $r = .314$), which according to Cohen (1988, 1992) might be considered medium to large effects. This was very encouraging. However, subsequent assessments have been less impressive. A meta-analysis by Frisina, Borod, & Lepore (2004) of 9 RCTs involving clinical populations with physical or psychiatric disorders found a significant but smaller overall effect for physical health outcomes ($d = 0.21$; $p = .01$), but no significant effect for psychological outcomes ($d = 0.07$; $p = .17$).

A meta-analysis of 61 RCTs by Meads, Lyons, & Carroll (2003), using both fixed and more conservative random effects analysis, concluded that there was no clear evidence demonstrating the efficacy of the intervention. The largest meta-analysis to date, involving 146 RCTs, was conducted by Frattaroli (2006). Using random effects analyses deemed appropriate for a larger and more heterogeneous range of studies, this found a small overall average effect for psychological outcomes ($r = .056$, 95% CI = $.026, .086$, $p = .00014$). This was comprised of 13 subcategories of which just three had significant effects: distress ($r = .102$, 95% CI = $.042, .161$, $p = .0016$), depression ($r = .073$, 95% CI = $-.011, .156$, $p = .043$), and positive functioning ($r = .045$, 95% CI = $-.009, .081$, $p = .0075$). For physiological outcomes there was a small overall average effect ($r = .060$, 95% CI = $.013, .106$, $p = .0075$). However, only one of 16 subcategories, immune system parameters, had a significant effect ($r = .099$, 95% CI = $-.007, .202$, $p = .032$). For reported health outcomes there was a small overall average effect ($r = .072$, 95% CI = $.036, .107$, $p = .00011$). Of three subcategories, two had significant effects. These were specific disease outcomes ($r = .128$, 95% CI = $.049, .204$, $p = .002$) and illness behaviours ($r = .073$, 95% CI = $.015, .131$, $p = .0075$).

These studies suggest there is an effect, but it is extremely variable. The problem may in part stem from the fact that the emotional disclosure/expression instructions offer participants no guidance or direction as to how they should approach or process their emotions. Thus, it is unclear what mechanism or mechanisms may be responsible for any effects. Various theories have been put forward. Inhibition theory (e.g., Pennebaker & Beall, 1986) based on Freudian notions of catharsis, suggests health benefits could stem from curtailing efforts to repress troubling memories. Cognitive processing theory (e.g., Sloan, Marx, Epstein, & Lexington, 2007; Ullrich & Lutgendorf, 2002) suggests benefits could stem from improving insights into causes and effects of

traumatic experiences, which in turn could contribute to a better understanding of one's person-environment relationship. Social integration theory (e.g., Pennebaker & Graybeal, 2001) suggests that the emotional disclosure could improve participants' communication and social functioning and hence access to social support. Exposure theory (e.g., Bootzin, 1997; Sloan, Marx, & Epstein, 2005) suggests that repeated activation (through writing sessions) of traumatic memories may eventually lead to habituation or desensitization. An enhanced working memory hypothesis (e.g., Klein & Boals, 2001) suggests the benefits could stem from reduced cognitive intrusions that might otherwise have interfered with one's ability to concentrate on problem-solving activities.

There is a further theoretical explanation, however, that is particularly relevant to this thesis, namely self-regulation theory. Here the purported benefits of writing stem from participants gaining clearer insights into the goal-related activities provoking their emotions. In terms of control theory and the discrepancy-reducing feedback loop (e.g., Carver & Scheier, 1982), the writing can be seen as encouraging the monitoring of sensory input into the loop, which in turn should facilitate corrective action to address any discrepancy.

Numerous studies have experimented with more explicitly self-regulatory instructions and tested their effects against the original Pennebaker & Beall (1986) emotional disclosure instructions. Cameron & Nicholls (1998), for example, instructed a group of students to write self-regulatory coping plans regarding adjusting to college life. For students classified as optimists, both the self-regulation and emotional disclosure conditions resulted in reduced illness-related clinic visits. For pessimists, only the self-regulation condition reduced clinic visits. This suggested that the writing tasks could be used to counteract maladaptive cognitions.

A study by King (2001) instructed students to either write about their goals (framed as their 'best possible selves'), their most traumatic life event, or a combination of the two. The 'best possible self' writing groups resulted in significant improvements in psychological well-being. Also, the single 'best possible self' condition and 'traumatic event disclosure' conditions resulted in fewer illness-related health centre visits compared to controls. The combined condition did not, however, suggesting a possible dilution or confusion effect, as previously discussed in section 2.3.1.

A study by Burton & King (2004) instructed students to write about intensely positive experiences. This was found to result in enhanced positive mood and fewer illness-related health centre visits compared to controls. They suggested that self-regulatory

benefits might stem from participants gaining a better understanding of their needs, priorities and emotions.

Such studies highlight a particularly useful feature of this experimental writing paradigm, namely the facility for direct comparison of different mechanisms. The Suls & Fletcher (1985) meta-analysis of coping strategy experiments, cited in section 2.2, noted that participants given any type of strategy generally fared better than uninstructed controls and consequently recommended simultaneous testing of alternative mechanisms. The relative brevity and simplicity of Pennebaker's writing paradigm can facilitate such comparison. Even multiple comparisons are possible. Guastella & Dadds (2008), for example, compared four different writing conditions to a control and Nazarian & Smyth (2013) compared five.

The brevity and simplicity of the paradigm have also facilitated the recruitment and testing of larger numbers of participants than feasible, for example, with expert-led CBSM training programmes. This has facilitated the investigation of a wide range of potential moderators. Variables considered include: gender (Range & Jenkins, 2010); alexithymia (Baikie, 2008); attachment style (Stroebe, Schut, & Stroebe 2006); optimism/pessimism (Cameron & Nicholls, 1998); trait anxiety (Danoff-Burg, Agee, Romanoff, Kremer, & Strosberg, 2006); and emotional approach coping (Austenfeld & Stanton, 2008).

Another advantage of Pennebaker's experimental paradigm is that participants' written output can be scrutinised to gain insights into adherence, the success of the manipulation and to search for possible mediating variables. Numerous studies, for example, have looked at language use, e.g., the number of words signifying positive or negative emotions or cognitive insight (e.g., because, realise) and possible trends across writing sessions. This has been facilitated by the development of various software tools (e.g., The Linguistic Inquiry and Word Count; Pennebaker, Francis, & Booth, 2001).

The fact that the manipulation is achieved solely through explicit written instructions is another advantage. It enhances experimental control and consistency, i.e., by providing all participants with exactly the same instructions. It also enables subsequent researchers to scrutinise and hopefully build on their research, e.g., refining manipulations to enhance any possible effects. For example, the King (2001) 'best possible self' intervention might perhaps have been improved by focusing on 'processes' rather than 'outcomes', as suggested by Taylor et al. (1998).

This thesis, therefore, proposes to use Pennebaker's experimental method as a framework for testing efforts to develop self-regulatory skills. It will deviate, however,

from conventional usage by pursuing an intermediate pathway between Pennebaker's classic experimental format and the more complex CBSM interventions discussed in section 2.3.1. This deviation will involve excluding the 'emotional disclosure' element, developing more detailed instruction sets and extending the length of the interventions.

The reason for excluding the emotional disclosure element is that it is a relatively loose form of manipulation. As will be discussed in Chapter 3, emotional disclosure/ expression may serve a variety of functions and so it is unclear exactly what self-regulatory mechanism is being triggered. This is also demonstrated by the range of explanatory theories discussed above.

A further limitation of the conventional emotional disclosure paradigm is that its simplicity and the need to match this in any contrasting experimental conditions, limit the depth and sophistication of alternative interventions that can be tested. The human social world is complex and people may often need (and decades of psychological research can arguably offer) more sophisticated guidance than the few lines of instruction typically provided in written emotional disclosure experiments. As an illustration, a study by Lestideau & Lavallee (2007) using Pennebaker's conventional paradigm, contrasted emotional disclosure with 'planful writing' (i.e., developing plans to deal with a problem) and found, contrary to their expectations, that participants' perceptions of control and self-efficacy in the planful writing condition decreased rather than increased as a result of the intervention. However, it might reasonably be questioned to what extent being asked to write plans on three occasions, without any new insights or techniques, can be expected to develop a sense of mastery.

This also illustrates the need for longer interventions. Three to four sessions following the most basic of instructions may be convenient for academic research and perhaps in part accounts for the paradigm's widespread use. However, with effects on average, according to Frattaroli (2006), declining after just one month, their practical use in real-world situations appears limited.

Thus, although Pennebaker's paradigm has many strengths and has been extremely successful in generating a large body of research, there are various ways in which it might be enhanced and extended. This thesis will therefore seek to demonstrate that with a few modifications and a slight change of direction, its strengths could be used to develop and test far more powerful and possibly more sustainable interventions.

More powerful writing interventions could also be useful in trying to influence cortisol levels. Though emotional disclosure interventions have generated some significant cortisol effects in specific circumstances, e.g., in reducing cortisol reactivity to re-exposure to trauma-related images in PTSD patients (e.g., Smyth, Hockemeyer, &

Tulloch, 2008), they have not been successful in significantly reducing general levels of cortisol in everyday life. Frattaroli's (2006) meta-analysis, for example, found no significant effects of emotional disclosure on cortisol and a more recent emotional disclosure writing experiment (O'Connor, Walker, Hendrickx, Talbot, & Schaefer, 2013) also failed to generate any significant effects.

However, more explicitly self-regulatory writing interventions have produced encouraging results. Dean (2009: unpublished data), for example, tested a problem-engagement writing intervention, designed to enhance progress towards goals, against a disengagement writing intervention. This resulted in a significantly lower cortisol awakening response (CAR) for the problem-engagement condition [$F(1, 40) = 5.54, p = .024$; Cohen's $d = 0.42$]. (N.B. the CAR is the initial surge in cortisol typically found in the first 30 to 40 minutes after waking. See section 3.3.3.) In a subsequent similar experiment, Teismann, Het, Grillenberger, Willutzki, & Wolf (2013) tested writing about life goals against a neutral writing control and again this resulted in a significantly lower CAR for the life goals condition, $F(2, 61) = 3.10, p < .05$. It is possible, therefore, that further enhanced self-regulatory writing interventions could generate more pervasive effects on cortisol, i.e., reducing levels across the whole day.

2.4 Conclusion

Stress and coping research has provided many insights into the relationship between how people respond to life's difficulties and their short- and long-term psychological and physical well-being. It has been argued in this chapter, however, that the fruits of such research have not been applied as widely or as effectively as possible and that academic researchers could help address this by creating more direct channels of communication with the public.

The particular route advocated in this thesis is to try to promote the widespread development of self-regulatory knowledge and skills. However, as these skills involve unseen mental processes, they are difficult to categorise and assess. Many studies have shown that training in self-regulatory skills can produce psychological and physiological benefits, but more precision is required to understand exactly what works for whom and how. Also, to be able to offer widespread training at a population level, interventions need to be more efficient and sustainable in terms of resource use.

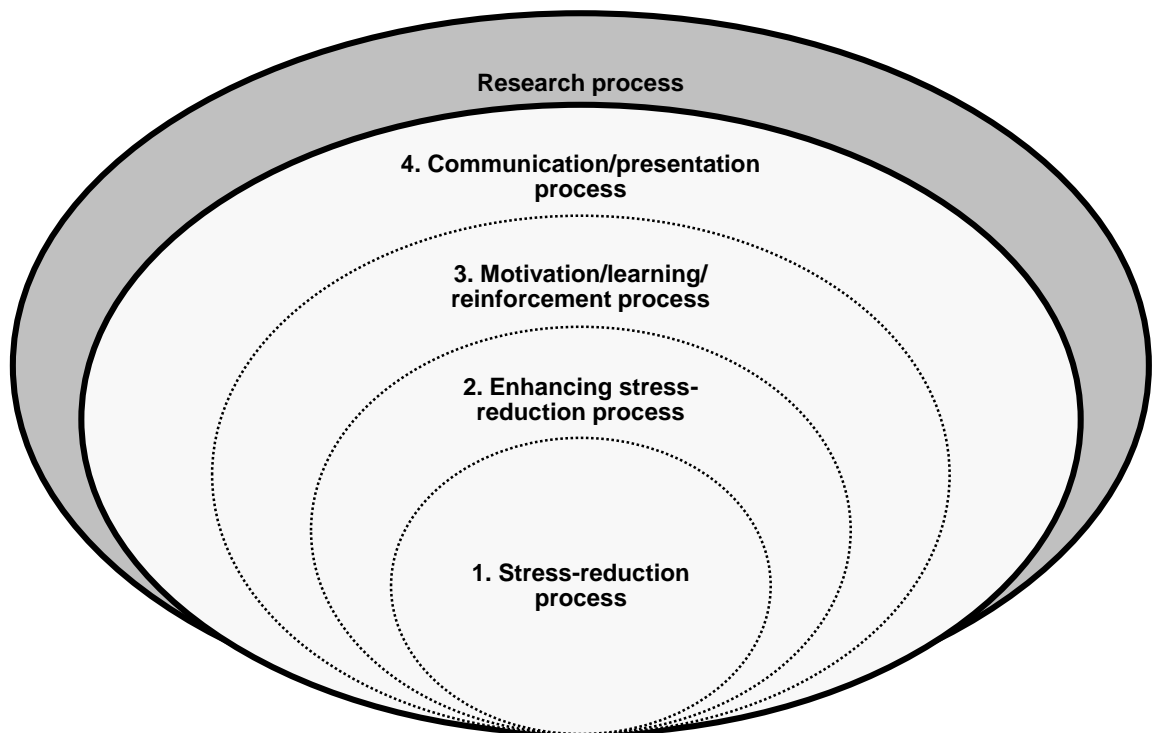
Pennebaker's experimental writing paradigm has been identified as a potential platform for such training, as it has a range of advantages that have arguably not been fully exploited. The next chapter, therefore, proposes a framework for developing and testing interventions on such a platform.

CHAPTER 3: DEVELOPMENT OF CONCEPTUAL FRAMEWORK AND INTERVENTION PROTOTYPE

3.1 Introduction

The previous chapter explained the rationale for seeking to develop an intervention based on writing tasks that could enhance self-regulatory skills in a sustainable way. It also outlined the challenges involved in trying to differentiate and test distinctive categories of skills. This chapter sets out a conceptual framework to help identify and develop such skills in a systematic way. The multilevel processes involved are illustrated in Figure 3.1 below.

Figure 3.1 Intervention development process levels



The outer shell represents the overall framework for conducting the research. As will be explained in section 3.2 below, this research process follows a recommended systematic approach emphasizing the use of theoretical models to guide the development and testing of interventions. Within this research framework, four theoretical process levels have been used in the design of the intervention. The levels are explained in detail in sections 3.3 to 3.6, but are briefly outlined below:

1. **Stress-reduction process** – This process level identifies the core self-regulatory stress-reduction mechanism targeted by the planned intervention. There are three sections addressing this level. The first explains how the intervention relates to other types of stress-reduction initiative. The second introduces a functional

taxonomy of coping behaviours to distinguish the self-regulatory mechanism targeted from other mechanisms. The third section describes the core mechanism in more detail and illustrates how the functional taxonomy can help operationalise self-regulatory mechanisms more precisely. It also discusses anticipated effects on key outcome measures.

2. **Enhancing stress-reduction process** – This process level seeks to systematically enhance the core self-regulatory coping mechanism targeted. It focuses on developing skills in three key areas highlighted by control theory (Carver & Scheier, 1981, 1982).
3. **Motivation/learning/reinforcement process** – The next level addresses how the enhanced stress-reduction skills can best be promoted, learnt and applied in a sustainable way. The core theoretical framework used is social cognitive theory (SCT; Bandura, 1986, 2001).
4. **Communication/presentation process** – The final process level addresses the presentation of the intervention in the resulting training manual, which is attached as Appendix C7.

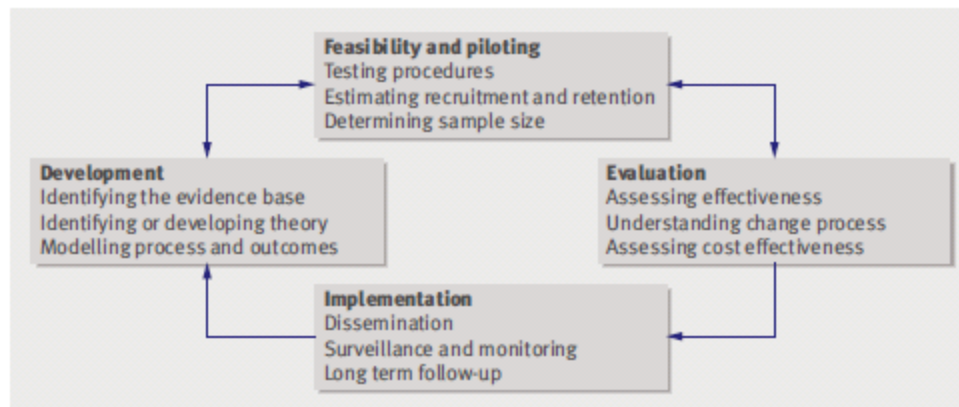
3.2 Research process

As the aim was to develop a more sophisticated and enduring intervention than typically used in Pennebaker's writing paradigm, the process was relatively complex. The complexity stemmed from the range of coping behaviours available and the challenge of determining what to incorporate and how. To steer a logical path through this complexity and to try to optimize the potential of the resultant intervention, the development process followed best practice guidelines from a recognised authority within the field of health psychology, namely the Medical Research Council's guidelines on 'developing and evaluating complex interventions' (MRC, 2000; Craig et al., 2008). The guidelines stress the importance of basing design and testing on explicit theoretical models and research evidence. Key process stages are outlined in Figure 3.2 on the next page.

The present chapter relates to the development phase, which has three components. The first is 'identifying the evidence base'. The rationale for this first step is that before committing resources to a development process, it is important to know whether evidence suggests there is a reasonable expectation of generating a worthwhile effect. This component was addressed in Chapter 2, which sought to demonstrate that CBSM interventions have succeeded in improving measures of subjective well-being and reducing cortisol. The chapter further cited evidence suggesting that less resource

intensive writing interventions also appear to be able to improve measures of subjective well-being and possibly also cortisol levels. The evidence base, therefore, suggests that there is a reasonable possibility of developing an effective writing-based stress-management intervention.

Figure 3.2 Development and evaluation processes (from Craig et al., 2008)



The second and third components of the development phase, i.e., ‘identifying or developing theory’ and ‘modelling process and outcomes’ are the focus of the present chapter. Use of theories and models should strengthen any resulting intervention by building on pre-existing scientific knowledge. Explicit use of models should also help clarify what processes and outcomes to target and measure.

The remaining elements of Figure 3.2 are addressed in subsequent chapters of this thesis. ‘Feasibility and piloting’ are addressed in Studies 1 and 2 (Chapters 4 and 6). ‘Evaluation’ is addressed principally in Study 3 (Chapter 8), a randomized controlled field experiment. ‘Implementation’ is discussed in Chapter 9.

However, as stated in section 1.4 of Chapter 1, the purpose of this thesis is not to create an ‘end’, but rather a ‘means to an end’. The ultimate goal is to be able to make self-administered evidence-based interventions widely available to the general public. As the ultimate aim is for such interventions to be used unsupervised, it is important to determine the conditions under which interventions may or may not work and offer appropriate guidance. This will require the development of an extensive evidence base, testing different variations of possible interventions on different populations and in different settings. A second wave of more sophisticated experiments extending Pennebaker’s paradigm could help generate such an evidence base. Use of an explicit conceptual framework, as outlined in this chapter, could assist such research by clarifying what each study has tested and by facilitating further refinement or substitution with alternative theoretical components.

A final point about the research process is that the emphasis was on developing and testing specific self-regulatory mechanisms. It was not about developing tailored or comprehensive solutions for particular groups of participants. Had this been the aim, the research process would have included assessment of participants' existing situations and specific needs, as recommended for example by intervention mapping (e.g., Bartholomew, Parcel, & Kok, 1998). However, the aim for the research described in this thesis was to gain insights into how people react to, learn and ultimately apply enhanced self-regulatory tools that might ultimately be incorporated into more tailored solutions.

3.3 Stress-reduction process

The self-regulatory mechanisms tested in this thesis were designed to tackle one aspect of a much larger equation. It is important, therefore, to situate the interventions within a broader context, as factors within this broader context could support or undermine their effectiveness. It is also acknowledged, as highlighted for example in reviews of workplace interventions (e.g., van der Klink et al., 2001; Giga, Noblet, Faragher, & Cooper, 2003), that individual-based initiatives alone are unlikely to guarantee employee well-being over the longer term.

The next section (3.3.1), therefore, locates the interventions within a broad social-ecological framework. Section 3.3.2 then discusses a narrower intra-individual framework for addressing self-regulatory coping mechanisms. Section 3.3.3 subsequently focuses on one particular element of this framework.

3.3.1 Overall stress-reduction framework

There are many different possible frameworks for specifying the scope of interventions. In the workplace, for example, Giga et al. (2003) specify three categories: individual; individual/organisational; and organisational. In health psychology, Engel's (1977) model also specifies three categories: biological, psychological, and social. McLeroy, Bibeau, Steckler, & Glanz's (1988) social-ecological model, shown in Figure 3.3 on the next page, has five levels. Such models can be used to specify not only the recipients of the intervention but also the content. For example, although the interventions in this thesis are solely targeted at individuals, the content could address all five levels of McLeroy et al.'s (1988) model. However, to facilitate experimental control, the content was restricted to two levels, the individual and the interpersonal. These two levels correspond to the 'psychosocial' elements of Engel's (1977) model, but with the social element limited to immediate interpersonal relations. The 'biological' element of Engel's model could also have been legitimately included as content, e.g., encouraging

participants to improve their diet or exercise more. However, it was not, as the aim was to focus solely on psychological coping techniques.

Figure 3.3 Social-ecological model spheres of influence (from McLeroy et al., 1988)



There is a further element not addressed in these models that relates to the sustainability of well-being. It is illustrated by Bronfenbrenner's (1979) notion of 'chronosystems' in his ecological model of human development. This involves taking into account one's place in time in a historical sense and addressing issues that may be unique to a particular time period. Thus, for example, given present day concerns over environmental damage caused by human activity, the content of self-regulatory training should arguably address the environmental sustainability of our goal pursuits. To reflect this, the overall framework for the research in this thesis could be described as an extension of Engel's (1977) model in that it is 'bio-psycho-social-ecological'.

3.3.2 Individual coping framework – Goal-state functional coping taxonomy

As outlined in the previous chapter, there are a number of problems with existing coping taxonomies and the self-report coping inventories with which they are associated. These include:

1. The taxonomies and inventories refer to broad categories of behaviour such as 'planning', but offer no depth of analysis within categories. For example, they offer no insight into individual differences regarding how activities are applied or how they might best be performed.

2. Distinctions between some coping categories can break down in practice, e.g., the distinction between problem-focused and emotion-focused coping, which hinges on a subjective definition of 'stressor controllability'.
3. Skinner et al. (2003) advocate grouping coping behaviours into distinctive lower order functional groupings (families) and higher order adaptive processes. However, as discussed in Chapter 2, their own attempt, the multiple families of coping taxonomy, arguably fails to provide clear and robust distinctions.

An alternative taxonomy is therefore proposed below. It does not involve any new theories or concepts. The aim was rather to present existing theory in a way designed to make it easier for the general public to understand and apply different types of coping strategy. This essentially involved emphasizing the underlying function of different coping behaviours. This also helped to guide the development of the core intervention within this thesis and to identify distinctive types of alternative interventions against which it might be tested. The title of the proposed taxonomy is the 'Goal-State Functional Coping (GSFC) taxonomy'. Its key features are:

1. It is top-down in nature and based on Carver & Scheier's (1981, 1990, 1998) model of behavioural self-regulation and the feedback loop (Figure 2.1) described in Chapter 2.
2. The GSFC taxonomy was devised to serve as a guide for experimentally inducing specific coping functions. It specifies four higher order categories (models) of self-regulatory coping behaviours, each of which constitutes a distinctive prototype for emotion regulation.
3. It focuses on identifying the underlying self-regulatory function or purpose of coping behaviours rather than simply grouping broad categories of behaviours according to similar surface characteristics, as exemplified by Skinner et al.'s (2003) treatment of 'cognitive restructuring' and 'distraction' discussed in Chapter 2.
4. Although as acknowledged in section 2.2, self-regulatory coping behaviours can include both automated and conscious/deliberate processes, the description of the taxonomy in this chapter focuses on the latter. This was seen as a logical first step, as the interventions that the research in this thesis seeks to improve upon focus on conscious processes.
5. In terms of psychological well-being, the primary variables addressed by the models in the taxonomy are positive and negative affect. The models can also be used to generate hypotheses regarding the impact of coping behaviours on physiological outcomes. As already stated, the physiological outcome measure

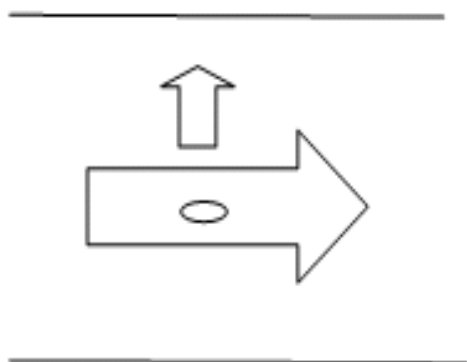
addressed in this thesis is cortisol, levels of which tend to be positively correlated with negative affect (Buchanan, al'Absi, & Lovallo, 1999; Jacobs et al., 2007; Smyth et al., 1998). The explanation in terms of control theory is that detection of a discrepancy between desired and actual goal states by the feedback loop triggers negative affect and subsequent cortisol secretion via the hypothalamic pituitary adrenal (HPA) axis. This cortisol secretion helps shift energy use within the body, mobilising it for action to address the discrepancy detected. Positive affect also appears to influence cortisol levels independently of negative affect. Greater positive affect tends to be associated with lower cortisol levels (e.g., Jacobs et al., 2007). However, patterns of association are inconsistent, possibly stemming from different measurements of positive affective states (e.g., hedonic versus eudaimonic well-being) and possibly due to the influence of various moderating variables such as age and gender (Dockray & Steptoe, 2010). As the complexities of possible interactions between positive and negative affect and cortisol are not fully understood, the simple working assumption adopted for the basic GSFC models is that the greater the balance of negative versus positive affect, the greater the levels of cortisol.

The GSFC taxonomy's four higher order categories of coping are outlined below. They are normative prototypes in the sense that they represent pure forms of distinctive strategies, to be used as guiding principles for intervention building.

1. GOAL MOMENTUM

This is the most complex category involving the most sophisticated self-regulatory skills. The rationale for this coping category is that facilitating progress towards goals should increase the balance of positive versus negative affect and reduce HPA axis activation. In Figure 3.4 A below, the person/brain (represented by the oval) is fully engaged in goal pursuit (i.e., within the goal arrow). There are no perceived barriers blocking or threatening progress. The upward arrow signifies positive affect generation.

Figure 3.4 A Goal-momentum model



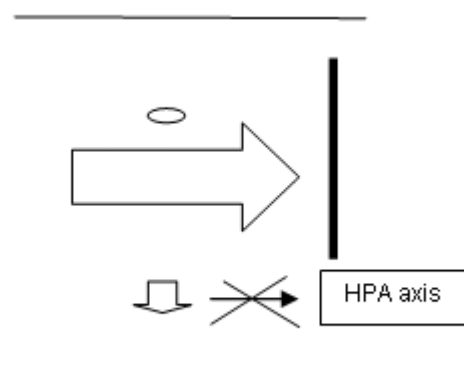
There is no downward negative affect arrow. The feedback loop (Figure 2.1), which compares current and desired states, can be viewed as located within the oval.

This category of self-regulatory coping behaviour overlaps to some extent with the 'approach coping' (e.g., 'problem engagement', 'information seeking') categories of other taxonomies. However, the logic underpinning this category is that successful coping, i.e., increasing the balance of positive versus negative affect and reducing HPA axis activation, requires not just engagement with problems, but successful engagement, i.e., achieving progress towards goals, which entails reducing any discrepancies in approach systems or enlarging discrepancies in avoidance systems. The aim of interventions promoting this type of behaviour, therefore, is to instil a capacity or perceived capacity to maintain goal momentum, despite whatever difficulties may arise. The Lestideau & Lavallee (2007) study cited in Chapter 2 may have induced problem engagement, but not necessarily goal momentum, as self-efficacy (Bandura, 1997) appeared to decrease as a result the intervention. Though the concept of goal momentum is relatively simple, the self-regulatory skills that may be required to achieve this can be very complex. These skills are considered in section 3.4.

2. GOAL-STATE DETACHMENT

The rationale for this coping category is that reducing the intensity, particularly of negative affect generation, should reduce HPA axis activation. In Figure 3.4 B below, the solid vertical line signifies that goal progress is blocked. The brain/person, again represented by the oval, is aware of the goal state (represented by being within the attentional tunnel – upper and lower horizontal lines), but is detached from the goal pursuit (shown by being outside of the goal arrow). The negative affect generated (downward arrow) is less intense (smaller) than if the person had not been detached. The crossed out horizontal arrow signifies that the negative affect is below the threshold for HPA axis activation.

Figure 3.4 B Goal-state detachment model



Goal-state detachment could be achieved in a number of ways, e.g.:

- (i) Intellectualisation – e.g., as demonstrated by Speisman, Lazarus, Mordkoff, & Davison (1964), who found that use of ‘intellectualisation’ soundtracks reduced stress responses to anxiety-evoking films.
- (ii) Humour – e.g., as demonstrated by Bennett, Zeller, Rosenberg, & McCann (2003), who found that watching a humorous video was associated with lower stress levels and improved immune function.
- (iii) Meditation – e.g., as demonstrated by Tang et al. (2007), who found that mindfulness meditation helped improve mood states (e.g., lower anxiety, depression) and reduced cortisol responses to laboratory-based stress testing.

The logic underpinning these types of coping is that becoming less immersed in the intensity of goal pursuits and outcomes may help reduce HPA activation when goals are frustrated or threatened. This might, however, also reduce the intensity of positive affect when goals are achieved.

In Figure 3.4 B the brain/person, represented by the oval, is shown above the arrow, detached from the goal on the positive affect side. Below the arrow, would signify negative detachment, e.g., a state of apathy, learned helplessness, depression or cynicism. This could be used as an explanation, for example, for muted cortisol responses found in some patients with depression (e.g., Huber, Issa, Schik, & Wolf, 2006; Stetler & Miller, 2005).

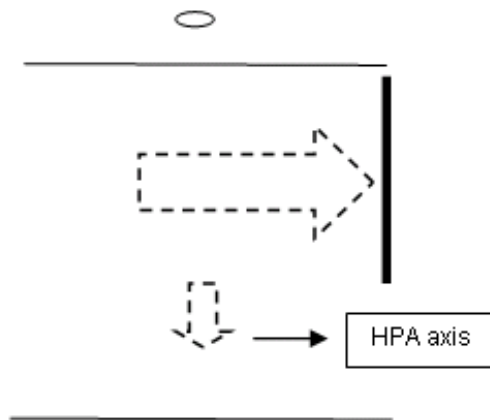
3. GOAL-STATE AVOIDANCE

The rationale for this type of coping is that, for example, when a goal is threatened or frustrated by an insurmountable barrier, avoiding thinking about it may reduce or eliminate the triggering of negative affect and associated HPA axis activation. Thus, in Figure 3.4 C on the next page, the person/brain is represented as being outside the attentional tunnel (parallel horizontal lines), i.e., ignoring the fact that the goal is blocked. The dotted outline for the goal arrow signifies reduced awareness. The logic is that negative affect should be eliminated to the extent that the individual can remove the adverse goal state from consciousness.

The coping literature tends to treat such avoidant coping as maladaptive over the longer term (e.g., Suls & Fletcher, 1985). As emotions are important signalling devices, helping us recognise whether or not we need to take corrective action to keep our goals on track, it would appear maladaptive to ignore them. In extreme situations in which there is no possibility of any corrective action, it might be considered adaptive. However, one might question the extent to which it is possible to completely ignore an

important adverse goal state. The difficulty is perhaps illustrated by repressive copers who report low levels of stress or anxiety, while exhibiting high levels of physiological arousal (e.g., Myers, 2010). This suggests that even if they are not consciously thinking about a stressor (adverse goal state), physiological responses may still be triggered below their threshold of consciousness, e.g., by environmental cues. This is depicted in Figure 3.4 C by showing that the HPA axis is still being activated.

Figure 3.4 C Goal-state avoidance model



4. GOAL-STATE SUBSTITUTION

The final category seeks to deliberately override negative mood and HPA activation associated with adverse goal states. It is not inherently adaptive or maladaptive. If used to support goal-state avoidance in a situation where corrective action was possible, it would be considered maladaptive. If used to support goal momentum, it would be considered adaptive.

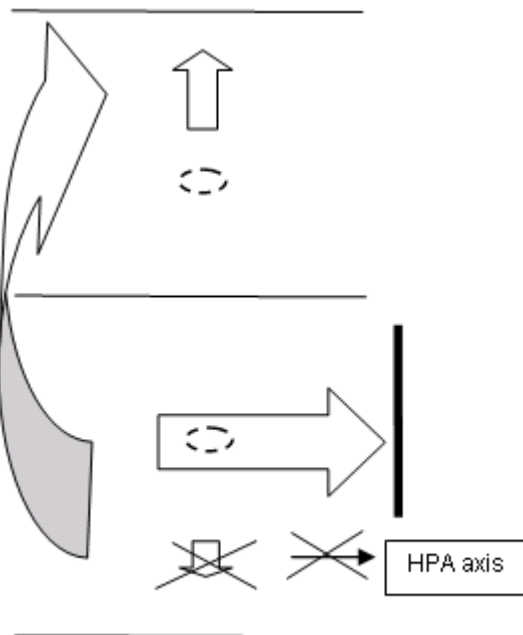
The difference with the previous category is that it does not involve trying to ignore or forget the adverse goal state. The dotted outlines for the two ovals (person/brain) in the two attentional tunnels (sets of upper and lower horizontal lines) in Figure 3.4 D on the next page, signify that the person is aware of the adverse goal state, but has temporarily shifted attention to a source of positive affect. The fact that there is no goal arrow in the upper attentional tunnel signifies that the source of positive affect is not related to making progress with an alternative conscious goal pursuit. If it were, it would be classified under 'goal momentum' (see section 3.3.3). In Figure 3.4 D, positive affect is deemed to stem from a source of instant or relatively instant gratification.

There are various routes by which this type of positive affect might be achieved:

- (i) Biochemical – e.g., this could be achieved through medication. It could also be achieved through food, alcohol or recreational drugs;
- (ii) Physical – e.g., exercise, relaxation techniques;

- (iii) Psychosocial – e.g., some type of entertainment, such as watching TV or playing video games.

Figure 3.4 D Goal-state substitution model



Adaptive use of such options would, for example, be where someone has taken action to address a particular stressor / goal threat, but there is still residual negative affect, which the person might wish to counteract. As highlighted by Suls & Fletcher (1985), shifting attention away from stressors can be adaptive in the short term.

It is possible, however, that each of these sources of positive affect could be pursued as a goal in their own right, as a quest for instant gratification, i.e., not just as a means of counteracting an adverse goal state. In extreme cases, such pursuits could become addictive and undermine other goal-related activities. Such issues are addressed in a revised version of the main GSFC model (goal momentum), discussed in Chapters 5 and 7.

Application of the GSFC taxonomy

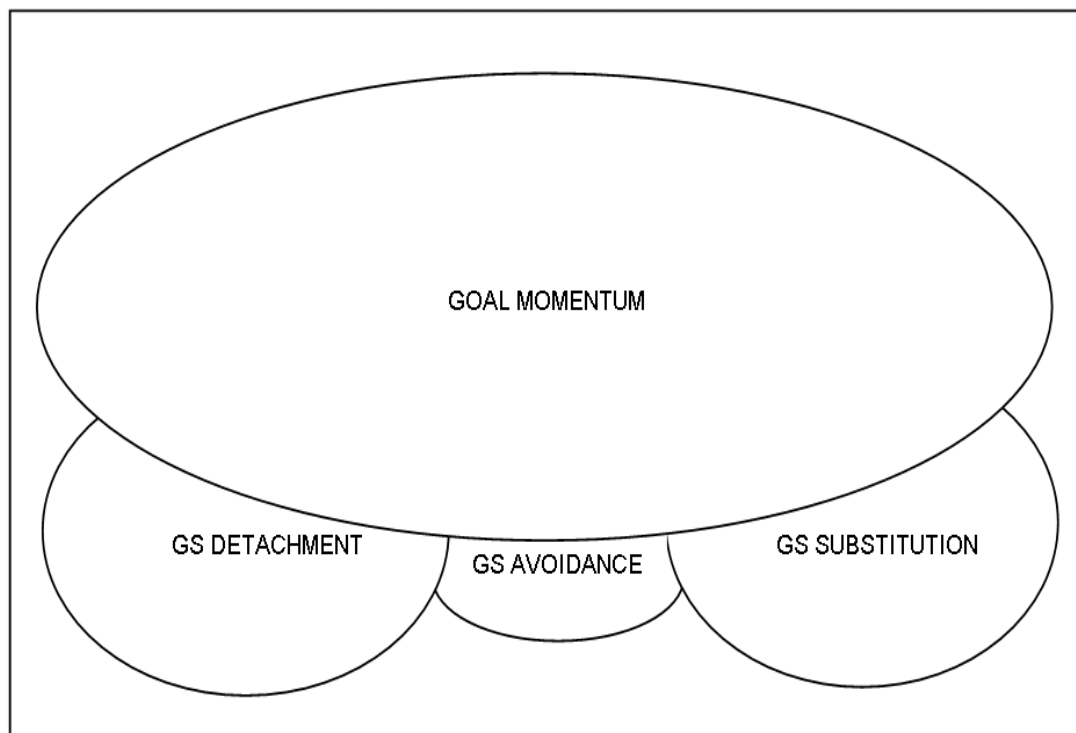
A key purpose of the taxonomy is to help strengthen interventions by focusing attention on the underlying self-regulatory mechanisms and systematically seeking to enhance them. This is demonstrated in the subsequent sections of this chapter.

The taxonomy and the models it contains can also play a key role in a more general educative sense, as the way models select and frame information can influence how the behaviours they seek to describe are perceived and performed. For example, as noted in Chapter 2, simply dividing coping behaviours into problem-focused and

emotion-focused might be interpreted by the public as implying that they are of equal value. However, Lazarus & Folkman (1984) presented emotion-focused coping as a secondary option for when problem-focused coping was unsuccessful. Thus, the primary coping objective should arguably be to regulate behaviour to overcome problems and achieve goals, rather than to regulate emotions to accommodate failure to achieve goals.

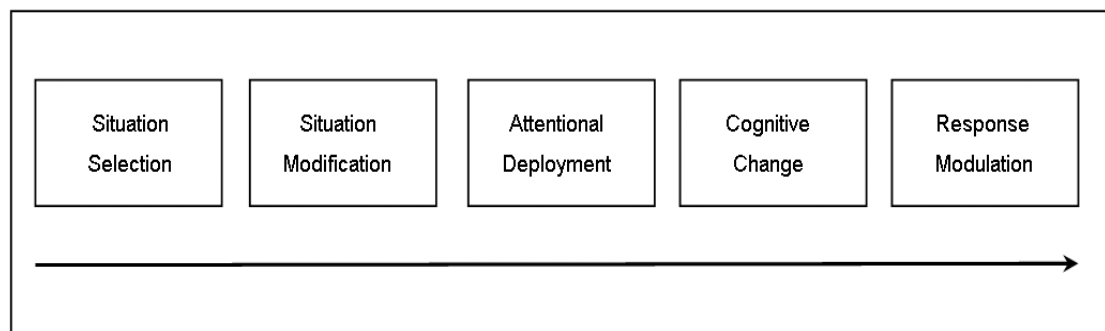
To reflect this, Figure 3.5 below illustrates the order of priority that might be given to the different groupings of self-regulatory strategies within the GSFC taxonomy. This prioritisation addresses some of the criticisms raised by Patmore (2006), for example, that too much emphasis has been placed on passive emotion-focused coping techniques, which are easier to teach.

Figure 3.5 Balance of priorities and skills within GSFC taxonomy



Considering the impact of models that might ultimately be popularised in the public domain is particularly important for self-administered training programmes without any ‘expert’ intermediaries to interpret them. This is illustrated by Gross’s (1998) process model of emotion regulation, which covers a similar range of coping behaviours to the GSFC taxonomy, but with a different emphasis. Figure 3.6 on the next page shows five core groupings of emotion regulation strategies at the centre of Gross’s model.

Figure 3.6 Core components of Gross (1998) process model of emotion regulation



The first element of the model 'situation selection', for example, draws attention to how someone might approach or avoid certain people or situations to regulate their emotions. An unintended consequence of using such a model might be that it encourages people to avoid issues or situations that they need to address to achieve important life goals. With the GSFC taxonomy this would be less likely, as it places a person's goals at the forefront of consideration.

Another illustration of different interpretations stemming from the Gross model is that it presents cognitive reappraisal (termed 'cognitive change') solely as a form of 'emotion-focused' coping. This is consistent with Skinner et al.'s (2003) classification of the term. However, within the GSFC taxonomy, cognitive reappraisal could serve a wide variety of self-regulatory functions. For example, it could be used for goal-state detachment, e.g., intellectualisation, i.e., reinterpreting an event using a different frame of reference. It could also be used to support goal momentum at various stages of the control theory feedback loop. For example, at the 'input function' stage, by considering different aspects of a potentially stressful situation; at the 'goal, reference value' stage, by reconsidering goal priorities or content; at the 'comparator' stage, by challenging possible erroneous interpretations of a complex situation; and at the 'output function' stage, by reconsidering and adjusting behavioural strategies.

A key aim of the GSFC taxonomy, therefore, is to help illuminate the breadth and depth of behavioural options open to people at a functional level. Improving understanding of the functional objective of behaviours, should enhance people's focus and their chances of success. As an example, emotional expression/disclosure, discussed in Chapter 2, could serve many different functions, e.g., helping people link their emotions to underlying goal states (input/comparator functions), or helping them enlist social support or negotiate for more resources (output functions). A clearer underlying objective presents a greater opportunity to refine the behaviour to achieve the desired outcome.

Limitations of GSFC taxonomy

The taxonomy as outlined above is not fully developed. It simply sets out distinctive routes (higher order categories) for increasing positive affect / reducing negative affect and reducing triggering of the HPA axis. Within each category there are numerous sub categories or mechanisms that could be specified. This will be illustrated with the 'goal momentum' category in section 3.3 below.

Interventions based on the various models within the taxonomy would seek to induce optimal self-regulatory behaviours and study their effects. It is acknowledged, however, that experiments would not test pure prototypical forms of such behaviours, as participants would be likely to apply them (a) with differing degrees of accuracy and efficacy, and (b) in conjunction with their pre-existing range of coping behaviours. The resulting experimentation, therefore, would fit more closely with a post-positivist than positivist paradigm (see section 1.3).

The taxonomy and constituent models are also very simplistic in terms of cortisol activation. As outlined above, the simple assumption is that the greater the balance of negative to positive affect, the greater the cortisol levels. Further illustrations of the models simplicity are that they do not specify a threshold for HPA axis activation or make any predictions about valence/arousal combinations or the impact of specific emotions. These are complex issues and are likely to vary from individual to individual.

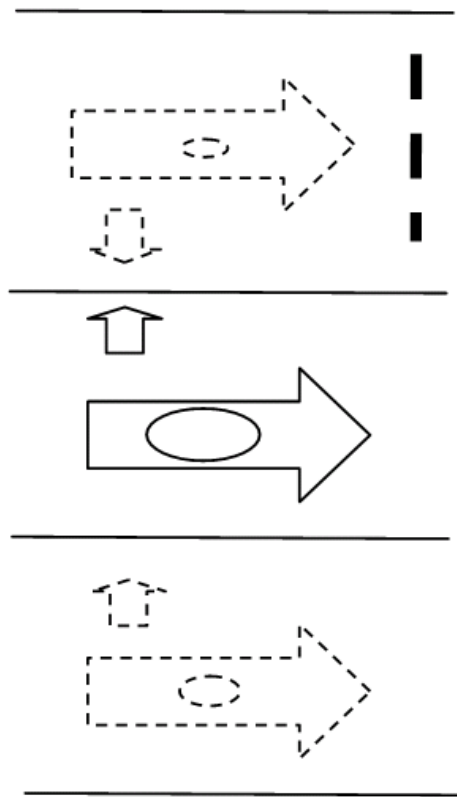
3.3.3 Specific coping mechanism – Goal-momentum model

The goal-momentum mechanism, the focus of the interventions in this thesis, will now be explained in more detail. The principle underlying the goal-momentum mechanism is that greater perceived progress towards goals should increase positive affect, reduce negative affect and reduce HPA axis activation. There are numerous ways, however, that this could be achieved and therefore numerous potential routes for interventions. Expanding the goal-momentum model slightly should help illustrate this.

The expanded model (Figure 3.7 on the next page) illustrates the fact that people pursue multiple goals, each with differing degrees of success or failure. A person's balance of positive and negative affect, therefore, will vary according to which particular goal state they are attending to. In Figure 3.7, the goal currently attended to is in the middle (shown in continuous lines). As there is no barrier to goal progress, the person should be experiencing positive affect. If the person were focusing on the top goal, he/she would be experiencing negative affect. This illustrates the importance of attentional focus and it is possible to include within the 'goal momentum' category, interventions that act by manipulating attention. Two examples are described below. Both might conventionally be considered more emotion-focused than problem-focused.

However, as demonstrated below, both can be operationalised in ways that promote goal momentum.

Figure 3.7 Goal-momentum model (expanded)



The first example is 'gratitude'. This typically involves participants being instructed to list things they are grateful for. This has been shown to increase positive and reduce negative affect (e.g., Emmons & McCullough, 2003). In the study cited, the instructions were very generic, simply asking participants to list up to five things in their lives they were grateful or thankful for. A possible explanation in terms of the goal-momentum model is that encouraging people to list or think about things they are grateful for, focuses attention on goal areas that are (a) presumably important to the individual, and (b) a desired goal state has been achieved. If this is the presumed mechanism, people's capacity to make progress towards their goals could be enhanced with more specific instructions, e.g., encouraging them to focus on positive goal states that might be attributed to their internal (e.g., self-efficacy) or external (e.g., social support) resources, as opposed to, for example, chance. The resulting increased awareness of personal resources could facilitate goal momentum in other domains.

The second example is 'benefit finding'. This typically involves participants being instructed to write about positive aspects of having to deal with something very stressful, such as fighting cancer. This has been shown to be associated with various health benefits, such as fewer health centre visits (e.g., Stanton et al., 2002). This

again is a form of attentional manipulation. To support goal momentum, it could be used to encourage participants to consider how alternative goals might be satisfied in a situation in which the currently salient goal is blocked. Thus, the instruction would be to search for opportunities to advance alternative goals, as opposed to simply thinking about positive aspects of their predicament. The latter could lead to the same forward thinking outcome, but it could equally be quite static. For example, participants' reflection might be present or past oriented, in which case it might overlap and therefore be confused with a 'gratitude' intervention.

The 'gratitude' or 'benefit finding' examples cited above illustrate how sometimes vague, open-ended intervention concepts could be translated into more precise interventions, using the GSFC models and control theory. Other similarly vague notions that could also be addressed more precisely include 'emotional processing', 'meaning making' and 'personal growth' (see Park, 2010). If all interventions were specified in this way, i.e., in terms of underlying self-regulatory functions, it could bring much more transparency and coherence to intervention research.

The two examples above illustrate ways of enhancing goal momentum, when progress on a core goal appears to be blocked. Application of a goal-momentum strategy, therefore, does not rely on having to distinguish between controllable and uncontrollable stressors. This makes it a feasible strategy for testing in real-life situations where people are likely to face a diverse array of stressors with differing degrees of controllability.

Though there are alternative strategies that might be pursued when progress on a core goal is blocked, the main strategy, however, envisaged for goal momentum is to increase the resources that participants can invest in their core goal pursuits. This is illustrated in Figure 3.7 by the different sizes of the ovals within each arrow. The size represents the amount of internal (e.g., knowledge, skills, self-efficacy) and external (e.g., money, social support) resources available to the individual. The greater the resources, the greater the potential for generating momentum for the arrow (goal pursuit).

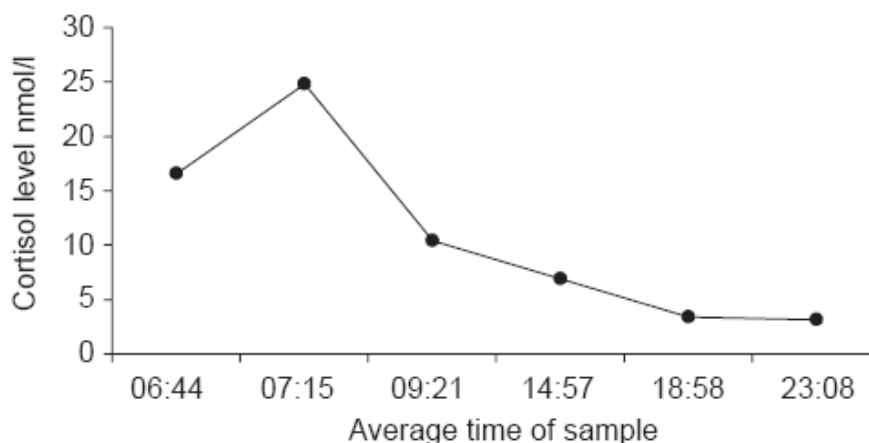
There are many ways in which a person's coping resources might be enhanced (e.g., training in technical skills or social skills such as assertiveness, negotiation, persuasion and eliciting social support). However, as highlighted by the review of CBSP interventions in Chapter 2, overcomplicating interventions may dilute their effects. A key objective for the training supporting goal momentum, therefore, is that it should promote a clear and simple strategy, namely maintaining a sense of progress towards valued goals.

As the surface cognitions and behaviours involved can be quite complex, providing a clear underlying sense of purpose is important. The interventions in this thesis, therefore, are designed in this way, based on the control theory feedback loop. Anticipated benefits are presumed to derive (a) from encouraging explicit performance of each element of the feedback loop, and (b) from systematically enhancing the performance of each element. The latter is addressed in section 3.4. A reason why (a) might in its own right be expected to improve well-being is that people may not ordinarily explicitly address each step. Feedback in Study 1 (Chapter 4), for example, will demonstrate that not everyone appears to set goals for themselves and interventions encouraging goal setting have been shown to enhance subjective well-being (e.g., MacLeod, Coates, & Hetherington, 2008).

The basic process envisaged in terms of psychological outcomes is that better use of self-regulatory coping skills should enhance goal progress. Goal progress should increase positive affect, reduce negative affect and enhance perceptions of self-efficacy. This in turn should facilitate further goal progress and so on.

The process for cortisol, which is addressed in Study 3 (Chapter 8), is more complicated. Figure 3.8 below shows a typical daily pattern of cortisol secretions. This begins with a sharp increase in the initial 30 to 40 minutes after waking (termed the 'Cortisol Awakening Response'; CAR) and then usually trails off across the rest of the day (Clow, Thorn, Evans, & Hucklebridge, 2004). The CAR and cortisol output over the rest of the day appear to be governed by different regulatory processes (Dockray & Steptoe, 2010). The CAR appears to be influenced by prior day emotional states (e.g., Adam, Hawkley, Kudielka, & Cacioppo, 2006), particularly just before sleeping (e.g., Wilhelm, Born, Kudielka, Schlotz, & Wust, 2007). The pattern for the remainder of the day appears to be influenced by emotional states of the day in question.

Figure 3.8 Diurnal cortisol pattern (from O'Donnell et al., 2008)



Despite the different timing mechanisms, the consistent assumption is that the higher the positive and lower the negative affect generated, the lower the cortisol. Another timing issue, however, is the frequency with which positive and negative affect are generated. A theory seeking to explain cortisol regulation that has received support in recent years is the 'perseverative cognition hypothesis' (Brosschot, Gerin, & Thayer, 2006). This suggests that a key factor responsible for cortisol secretion is repeated or chronic activation of cognitive representations of stressors, i.e., rumination about past events or worry about future events. In terms of the feedback loop, this can be interpreted as an excessive form of monitoring (i.e., the input and comparator functions of the feedback loop). To address this possible mechanism, the studies in this thesis include measures assessing the frequency / habitual nature of negative thoughts.

Although, as stated above, the GSFC taxonomy models do not specify a threshold for HPA axis activation, it is possible to identify situations most likely to trigger an activation. A meta-analysis by Dickerson & Kemeny (2004) of acute laboratory stress studies suggested that cortisol responses were greater when tasks were uncontrollable and/or involved social-evaluative threat (i.e., being negatively judged by others). These findings can be explained in terms of control theory as follows.

Firstly, the more difficult a task (goal pursuit) is to control, the greater the potential threat to progress, the greater the negative affect and the greater the need for a mobilizing stress response to increase goal pursuit effort. Secondly, negative judgments by others constitute a threat to one's social status / self-esteem / self-worth. These are key personal resources (represented in Figure 3.7 by the size of the oval within the goal arrow). Diminution of these resources generally weakens an individual's capacity to progress towards future goals, i.e., his or her social currency is undermined.

Two key objectives, therefore, for reducing cortisol levels were to enhance people's sense of control over their goal pursuits and to strengthen their defences against social-evaluative threat. The first was attempted by encouraging better choice, monitoring and pursuit of goals; the second by explicitly addressing 'self-image' as a goal and by seeking to reinforce self-esteem and self-efficacy.

To achieve these and other self-regulatory objectives, the planned intervention needed to successfully change behaviours. Abraham & Michie (2008) set out a taxonomy of 26 behaviour change techniques (BCTs) and linked them to specific theoretical frameworks. For the core framework underpinning this particular intervention, control theory (Carver & Scheier, 1981, 1982), they highlighted the following four behaviour change techniques:

1. Prompting specific goal setting

2. Prompting review of behavioural goals
3. Prompting self-monitoring of behaviour
4. Providing feedback on performance

The taxonomy has since been expanded. First to 40 (Michie et al., 2011) and more recently to 93 BCTs (Michie et al., 2013) and is likely to be developed further. The key objective in relation to control theory is to ensure that each of the elements in the feedback loop is addressed by interventions. As highlighted above, benefits should firstly ensue simply from encouraging more concerted performance of each element of the feedback loop. These four BCTs were therefore incorporated into the intervention design.

The BCT taxonomy has largely been applied to observable health behaviours, such as increasing physical activity or losing weight (e.g., Michie, Abraham, Whittington, McAteer, & Gupta, 2009). For such issues, applying control theory may be relatively simple, e.g., setting specific target weights and regularly weighing oneself to monitor progress.

However, developing self-regulatory skills to cope with life more generally and deal with a vast array of potential stressors, represents a much greater challenge. Simply specifying BCTs at the level of 'prompting specific goal setting' or 'prompting self-monitoring of behaviour' offers only minimal guidance. Individuals need to balance multiple goals, appraise complex situations and pursue their aims in dynamic competitive environments. Basic control theory arguably offers insufficient guidance, as following what is essentially a schema for a central heating control system can only take people so far. Self-regulatory skills, therefore, need to be explored, developed and ultimately taught in far more depth. This is the focus of the next section.

3.4 Enhancing stress-reduction process

This section explains the choice of the main theories and concepts incorporated into the initial pilot goal-momentum intervention tested in Study 1 (Chapter 4). The intervention was delivered via a training manual, which is attached as Appendix C7.

As highlighted by Michie et al. (2013), the CONSORT guidelines for reporting randomised trials of 'non-pharmacological' interventions call for precise description of the interventions used. However, in practice descriptions are often incomplete or lack adequate detail (Glasziou, Meats, Heneghan, & Shepperd, 2008). The BCT taxonomies constitute an attempt to bring clarity and precision to the description of the key 'active' components of behaviour change interventions. The ultimate aim is to build a more transparent knowledge base. However, even when a particular behaviour

change technique has been identified, such as ‘prompting specific goal setting’, there are many different ways in which this might be attempted, e.g., in terms of how instructions are framed and presented to participants. An advantage of the interventions described in this thesis is that, as they are delivered via written instructions, the whole intervention can be reported and easily replicated. Thus, not only the theories and techniques but also how they have been translated into practice is open to scrutiny and improvement by others.

The title of the training manual in Appendix C7 is ‘3-i Problem solving: applied to stress’. The reasoning for the title was that the self-regulatory skills presented were more than just about reducing stress. However, as explained in Chapter 1, the intervention was presented as a means of ‘stress reduction’, as this was perceived to be a familiar concept to participants and organisational gatekeepers. Though the techniques were about more than ‘problem solving’, this term was used rather than ‘self-regulation’. Again, this was because it was deemed simpler to use terms with which participants were likely to be familiar, particularly as there was no direct verbal communication.

The ‘3-i’ stands for three ‘intelligences’, three constructs developed to explore three different aspects of the control theory feedback loop in much more depth. They are:

1. **Strategic intelligence** – (addressing the ‘goal, reference value’ function). This involves taking a more strategic view of goal pursuits, addressing issues of balance and prioritisation and the likelihood of achieving different types of goal.
2. **Perceptual intelligence** – (addressing the ‘input’ and ‘comparator’ functions). This involves developing the capacity to detach oneself from and objectively interrogate one’s perceptions to gain more balanced, accurate assessments of people, situations, problems, and possible solutions.
3. **Tactical intelligence** – (addressing the ‘output’ function). This involves developing one’s resourcefulness and creativity in managing to keep on track with daily goal pursuits.

As with the GSFC taxonomy, these three constructs did not represent anything new in terms of self-regulatory theory. They simply constituted an attempt to raise the public profile of three key sets of self-regulatory skills. It was also hoped that describing them as ‘intelligences’ might render their application more appealing to end-users.

Successful application of each type of intelligence should enhance goal momentum and reduce stress responses. Combining all three should produce a stronger effect. The planned intervention sought to develop these three intelligences in a systematic

way, drawing on relevant psychological theories and incorporating them into writing activities designed to channel thinking in adaptive ways. To systematise the search for material to develop each type of intelligence, the following three dimensions were explored: **internal** factors (relating to the self or the person), **external** factors (relating to the environment or others) and **time** factors (**I/E/T**). The rationale and key materials gathered for each type of intelligence are outlined below.

3.4.1 Strategic intelligence (SI)

The rationale for the 'strategic intelligence' construct stems from the fact that the types of goals people choose to pursue, shape their chances of success and the nature of any rewards. Some goal pursuits are more vulnerable to external threats and thus more susceptible to stress than others. Also, some goal pursuits are more conducive to long-term well-being than others. Thus, helping people make more adaptive strategic goal choices is a key step towards reducing vulnerability to stress and enhancing long-term well-being.

Two key aspects of goal choice that the intervention sought to address were the content of goals and the framing of goals, i.e., what to aim for and how best to conceptualise this. In terms of content, the main theoretical underpinning was self-determination theory (SDT: Ryan & Deci, 2000), which postulates three core human needs:

1. **competence** – being good at something, a capable human being;
2. **autonomy** – being self-directed, having the freedom to act according to one's own values and beliefs;
3. **relatedness** – having a sense of belonging/closeness to others.

Each of these three types of needs were emphasized and supported within the intervention.

A key contribution of self-determination theory at a conceptual (goal framing) level is the distinction between intrinsic motivation (i.e., behaviours performed for their own inherent satisfaction and enjoyment) and extrinsic motivation (behaviours ultimately directed by others and linked to contingent external rewards/threats). Evidence suggests (e.g., Kasser & Ryan, 1993, 1996) that intrinsic aspirations (goals such as affiliation, personal growth and community that directly satisfy basic needs) are positively associated with well-being indicators such as self-esteem and negatively associated with measures of depression and anxiety. Conversely, extrinsic aspirations (goals such as wealth, fame and image) have been found to be negatively associated with well-being. The SI element of the intervention, therefore, encouraged identification with the former goal types.

Other theories could be substituted in place of SDT. A key reason for choosing this particular theory was that it emphasizes the importance of relatively simple intrinsic goals that should be within the grasp of most people. In contrast, Maslow's (1954) hierarchy of needs, for example, sets an ultimate goal of 'self-actualisation', which could be seen as creating rather abstract, idealistic expectations that may be difficult to fulfil. Different theories may be appropriate for different settings. Unlike Maslow's hierarchy, SDT does not explicitly address basic physiological needs, such as for food, water and shelter. This may not be a problem in countries where fulfilment of such needs is taken for granted, but could of course be an issue elsewhere.

The internal/external/time (I/E/T) framework was systematically applied to generate further goal-framing / conceptual distinctions (i.e., other than intrinsic/extrinsic). Not everything fitted neatly into the three dimensions, but they helped identify the issues outlined below.

SI – Internal factors

In relation to the self, the key conceptual distinction highlighted was between 'primary' and 'secondary' goals, as individuals were encouraged to think strategically about their needs and priorities in life. The framework used was Carver & Scheier's (1998) goal hierarchy. See Figure 3.9 below.

Figure 3.9 Goal hierarchy (adapted from Carver & Scheier, 1998)



The intervention directed people to imagine their ideal self/situation and then to translate this into primary (flexible, abstract) and then secondary (more concrete) goals for various life domains, e.g., self-image, health, relationships, work, finances, leisure, etc. Self-image was explicitly addressed as a goal, in view of the impact of social-evaluative threat highlighted by Dickerson & Kemeny (2004). Also, in line with Linville's (1987) self-complexity buffering hypothesis, participants were encouraged to set goals for themselves in multiple domains, to reduce the potential impact of adverse outcomes

in any one particular domain. The importance of flexibility at the primary goal stage was emphasized, as this generated more choice and hence control at the secondary goal stage. This was deemed to support the autonomy component of SDT. The other two components, competence and relatedness, were emphasized by means of examples, e.g., developing 'positive self-image' and 'good relationships'.

SI – External factors

The emphasis here was on considering factors within the environment relevant to goal setting. Thinking about external resource availability highlighted the distinction between zero sum (competitive) and non-zero sum (non-competitive) goals, with the latter being identified as more conducive to life satisfaction (Headey, 2008). For ease of comprehension, the terms used in the intervention were 'limited resource' versus 'unlimited resource' goals.

SI – Time factors

The primary-secondary goal distinction in Figure 3.9 could be considered a 'time' issue, with primary being long term and secondary being more immediate. A key element in reducing vulnerability to stress associated with blocked goals was to encourage participants to plan alternative secondary goal routes in support of primary goals, so that if a particular secondary route were blocked, this would not necessarily threaten the underlying primary goal.

Another time-related factor involved the distinction between 'process' and 'outcome' goals. As highlighted by Taylor et al. (1998), focusing on present processes rather than future outcomes appears more conducive to goal attainment. Various generic time-management principles were also incorporated into the intervention, such as the need to prioritise and the distinction between urgency and importance.

Although it did not fit neatly into one of the I/E/T categories, the intervention also highlighted the distinction between approach and avoidance goal types (e.g., Higgins, Roney, Crowe, & Hymes, 1994), advocating the former as being more conducive to well-being. (N.B. This also suggests there may be other categories to use to generate ideas.)

A further time factor that was considered for inclusion was the notion of affective forecasting (e.g., Gilbert, Gill, & Wilson, 2002). Understanding potential judgment errors in forecasting future affective states could help in goal setting. However, it was excluded due to concern about the intervention becoming too long and complex. A number of other judgment biases were included, however, in the 'perceptual intelligence' component, which is addressed next.

3.4.2 Perceptual intelligence (PI)

The importance of this construct is highlighted by the fact that the conscious brain does not just passively reflect what is in our environment, but instead constantly filters and interprets our experiences. Our perceptions of discrepancies between desired and actual states and of possibilities for remedial action may not therefore be correct. This is illustrated, for example, by phenomena such as change blindness (e.g., Simons & Rensink, 2005); attentional biases (e.g., Bar-Haim, Lamy, Pergamin, Bakermans-Kranenburg, & van Ijzendoorn, 2007); shallow processing of language (Sanford & Sturt, 2002); judgment biases and heuristics in decision making (e.g., Tversky & Kahneman, 1974); and the pliability of memory (e.g., Loftus & Palmer, 1974).

Such phenomena are difficult to correct, as they tend to occur automatically beyond our conscious awareness. The first objective, therefore, was simply to draw people's attention to the fact that their first impressions may not necessarily be correct.

Promoting 'perceptual intelligence' as a construct could help raise awareness of this. An initial practical step in the intervention was to encourage participants to distinguish between facts and impressions/assumptions. A further step involved helping people identify and attempt to remedy common perceptual biases. Initial drafts of the intervention sought to illustrate various heuristics and decision making biases (e.g., availability heuristic; Tversky & Kahneman, 1973; anchoring; Tversky & Kahneman, 1974), but this was deemed too abstract and timing consuming for participants.

Instead, a list of 'unhelpful thinking styles' (e.g., black and white thinking, catastrophizing) was sourced from a clinical psychology website (Centre for Clinical Interventions, 2007) and adapted by adding suggestions for how to remedy each type of bias. The biases were nominally split into two categories (selection biases versus processing biases) to try to mirror the distinction between input function and comparator, but no further differentiation was made, i.e., participants were not instructed to treat selection biases any differently to processing biases.

This PI component of the intervention, therefore, had features in common with cognitive behaviour therapy (CBT; e.g., Beck, 1976). A difference with conventional CBT, however, was that the intervention was not designed to tackle extreme distortions of thinking or behaviour that might be found in clinical populations. Instead, the aim was to encourage greater flexibility, balance and depth of thinking in relation to the monitoring and assessment of goal progress. A further difference with CBT was that as participants' appraisals of problems may in many cases have been accurate, other self-regulatory solutions might be required to facilitate goal momentum, such as choosing more appropriate goals (strategic intelligence) and/or executing them more effectively (tactical intelligence).

As in the previous section, the I/E/T dimensions were systematically considered to highlight different ways in which PI might be applied. For example:

PI – Internal factors

These included perceptions of self, e.g., views/assumptions regarding one's performance, personality, skills, resources, worth, opportunities, etc. More accurate, balanced judgements in this domain, for example, could help bolster defences against social-evaluative threats.

PI – External factors

These included perceptions of others, situations or problems faced, available resources and remedies. Making accurate judgements (e.g., about other people's demands, expectations and motives) is extremely important when trying to balance demands and resources (see 'Tactical intelligence' section).

PI – Time factors

The perseverative cognition hypothesis, cited in section 3.3.3, highlighted potential dangers of ruminating too much on the past or worrying too much about the future. The intervention, therefore, encouraged focus on the present or immediate future, and emphasized the importance of following thought with action, i.e., the output function of the feedback loop.

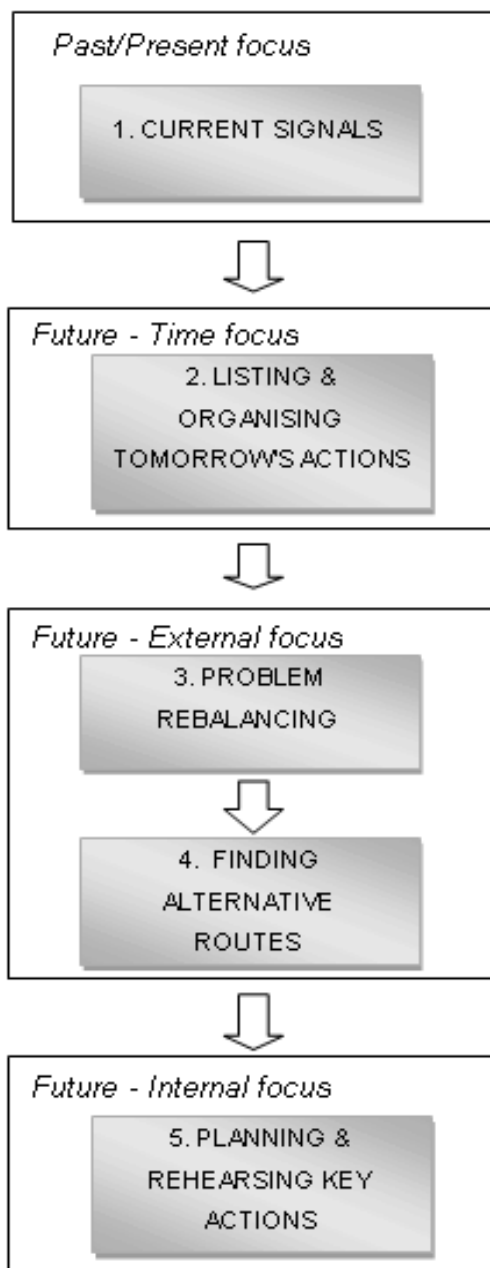
3.4.3 Tactical intelligence (TI)

Whereas strategic intelligence focuses on long-term goals, tactical intelligence focuses on short-term, day-to-day goals. As we can only act in the present, on a day-to-day basis, tactical intelligence constituted the core of the intervention. TI essentially involves applying various skills to enhance progress towards goals. The TI elements were based on staple ingredients of conventional stress-management programmes, such as time management (e.g., Jex & Elacqua, 1999) and basic problem solving (e.g., D'Zurilla & Goldfried, 1971; Houts, Nezu, Nezu, & Bucher, 1996). A key difference, however, was that the principles were translated into daily writing activities. A further difference was that the activities were structured in a systematic way, forming an incremental scale designed to match differing levels of problem complexity. The purpose was to try to overcome the possible dilution effect of complex interventions (highlighted by Richardson & Rothstein, 2008), by providing a coherent system for participants to follow.

The incremental scale is shown in Figure 3.10 on the next page. The figure also shows the application of the I/E/T dimensions. The logic underpinning the incremental scale is that the initial, and possibly most widely applicable activity for reducing stress, is time

management (i.e., time focus). At the next level up, some problems (i.e., goal impasses) may not be overcome simply by time management. The emphasis, therefore, shifts to trying to either reduce demands / increase resources or find alternative secondary goals routes to a particular primary goal. This constitutes a predominantly 'external focus', i.e., on the problem situation. Once the solution has been decided, if the required action is straightforward, implementation should be relatively automatic. The next level up, however, is reserved for problem situations where the solution to the problem requires actions that may be difficult for the individual to execute successfully. This might, for example, involve negotiations with an uncooperative party. The activity here is 'internally focused' on a process goal, i.e., rehearsing what to say or do.

Figure 3.10 Tactical intelligence activities



The instructions for the five TI writing activities are set out in the training manual for Study 1 (Appendix C7). The reasoning for each section and references to key supporting evidence are outlined below.

1. Current signals

This activity encouraged individuals to monitor and learn from goal pursuit successes and failures. It was included to provide the essential feedback function stipulated by control theory. As the intervention was to be self-administered, participants needed to fulfil this function themselves. The activity, therefore, involved acknowledging cognitions and emotions (inputs), linking them to relevant goals (reference values) and drawing conclusions about the nature of any discrepancies (comparator). This then led to the subsequent activities, i.e., deciding on required actions (outputs).

A traffic light analogy was employed to make the exercise more memorable. Red was associated with negative emotions and encouraged participants not just to passively experience and suffer negative emotions, but to constructively interrogate them to understand their goal-related origin and identify possible routes to a solution. Green was associated with positive emotion and goal progress. As this required no corrective action, the emphasis was on reinforcing self-efficacy through reflecting on how success had been achieved. It was also intended to act as a form of self-affirmation (Creswell et al., 2005; Lange, Richard, Gest, De Vries, & Lodder, 1998) to boost self-esteem and act as a buffer against social-evaluative threat. Amber was principally included to ensure the activity habit was maintained on days when there were no particularly strong positive or negative emotions. Amber encouraged individuals to make more effort to pursue their key life goals.

2. Listing and organising tomorrow's actions

This activity was designed as the 'thin end of the wedge', i.e., it took a basic habitual activity that many people do, i.e., listing things to remember to do. It then grafted on a range of time-management extensions, such as prioritising, deciding minimum essential goals, and optimal sequencing and combining of tasks (e.g., Jex and Elacqua, 1999).

3. Problem rebalancing

This activity was principally shaped by Lazarus & Folkman's (1984) notion of comparing demands and resources. It was designed to encourage participants to deconstruct problems and search for solutions in a systematic way (applying internal/external/time constructs to demands and resources), that would generate more options for them to choose from. The concept of satisficing (e.g., Schwartz et al., 2002) was also included to encourage relaxing of internal demands, particularly for peripheral

aspects of desired goal states. The overall aim of problem rebalancing was to boost participants' sense of autonomy and self-efficacy when encountering problems that blocked goal progress.

4. Finding alternative routes

This was based on classic problem-solving principles (e.g., D'Zurilla & Goldfried, 1971) in response to a blocked goal pathway. This activity corresponded to the 'generation of alternatives' stage of D'Zurilla & Goldfried's problem-solving process, for which they advocated use of Osborn's (1963) 'brainstorming' method. The latter, however, is a relatively open-ended process and may have been difficult for participants who perceived themselves to be lacking in creativity. Therefore, to provide a more structured approach, participants were instructed to use their hierarchy of primary and secondary goals (as explained in the SI section) to generate alternative solutions.

If the primary goal could not be attained via an alternative secondary route, to maintain goal momentum, participants were encouraged to consider alternative primary goals that might be satisfied. This constituted a form of benefit finding discussed in section 3.3.3.

5. Planning and rehearsing key actions

The principal source for this activity was the notion of implementation intentions (e.g., Gollwitzer, 1993; Sheeran, Milne, Webb, & Gollwitzer, 2005), which involve visualising and planning exactly when, where and how a particular goal intention will be translated into action. The core mechanism entails linking goal-directed actions with specific situational contexts, using 'if-then' plans. The 'if' component involves identifying a specific situation or opportunity to act. This has been found to heighten the accessibility of relevant situational cues, which for example reduce the chances of an individual forgetting to perform the behaviour when the situation arises. The 'then' component involves specifying the particular behaviour one will perform when the situation identified is encountered. This second component is understood to render the execution of the goal-directed behaviour more automatic. This automaticity has three key features. Firstly, greater immediacy or speed of reaction to the situational cue; secondly, greater efficiency of execution, in the sense that it is less cognitively demanding and less of a drain on will power; and thirdly, acting without conscious awareness of either the situational cue or the behaviour.

Use of implementation intentions was therefore expected to facilitate the translation of goal intentions into action (i.e., bridging the intention-behaviour gap; Sheeran, 2002). As TI Activity 5 involved relatively complex behaviours, implementation intentions were expected to be particularly helpful in elaborating goal intentions. However, even where

goal-directed behaviours were relatively straightforward (e.g., T1 Activity 2), it was envisaged that implementation intentions could still be helpful, e.g., through counteracting potential problems of intention activation. As highlighted by Sheeran et al. (2005), implementation intentions can help overcome situational priming of competing goals and resist environmental distractions or detrimental internal states such as boredom or fatigue. They appear not to add anything, however, where there is no volitional challenge, i.e., where the goal-directed behaviour is easy to perform.

A final point concerns the operationalization of implementation intentions. It was decided to use a 'what, when, where and how' format rather than 'if-then' format for the following reasons:

1. The principal aim of Activity 5 was to facilitate intention elaboration for particularly complex goal intentions. This potentially involved diverse sequences of behaviours contingent upon various possible third party reactions and counter reactions. It was felt that there was too much uncertainty to be able to reliably navigate one's way through a complex encounter using a series of pre-set specific if-then propositions.
2. In Activity 2, the 'what, when, where and how' format was used for a different reason. There was a concern that as participants were likely to be pursuing multiple goals each day, if they were given a novel 'if-then' technique, they might over apply it or apply it inappropriately, e.g., in the absence of volitional challenge. It was considered that visualising 'what when where and how' might be less prone to misuse, as participants might possibly have more of an inherent feel for where such visualisation might and might not be useful, as it was perhaps more naturalistic than forming 'if-then' propositions.
3. As the training activities were already highly structured and possibly already overly prescriptive (see section 3.6), it was considered that requiring participants to formulate if-then plans might exacerbate this. The issue was not so much about how to form 'if-then' statements, but rather the need to explain the circumstances in which if-then plans might be appropriate or inappropriate.

It is unclear whether the choice of operationalization format may have weakened the potential impact. Studies such as Oettingen, Hönig, & Gollwitzer (2000; experiment 3) and Chapman, Armitage, & Norman (2009) suggest this is possible. However, a meta-analytic review of 26 interventions using implementation intentions to promote physical activity, by Bélanger-Gravel, Godin, & Amireault (2013), found no superior effect for if-then statements. This is something that could perhaps be tested empirically in follow-up studies.

3.5 Motivation/learning/reinforcement process

The enhanced stress-reduction activities outlined above constituted a set of 'health-related behaviours'. Within health psychology, a variety of models, termed 'social cognition' models, have been devised to identify and measure the influence of different cognitive constructs on the initiation and maintenance of adaptive health behaviours. Identification of the key cognitive determinants of health behaviours enables subsequent targeting of these key variables within behaviour change interventions.

As explained in Chapter 1, the aim of this thesis was not to develop an end intervention, but rather a framework for developing and testing different self-regulatory writing tools that might later be incorporated into end interventions. The experiments in this thesis were designed to investigate a middle ground between brief writing experiments (such as emotional disclosure or gratitude tasks) and complex CBSP interventions involving multiple skills. The former tend not to address motivation, learning or reinforcement processes, as they are relatively short and tend to involve university students motivated by curiosity, modest financial reward or course credits.

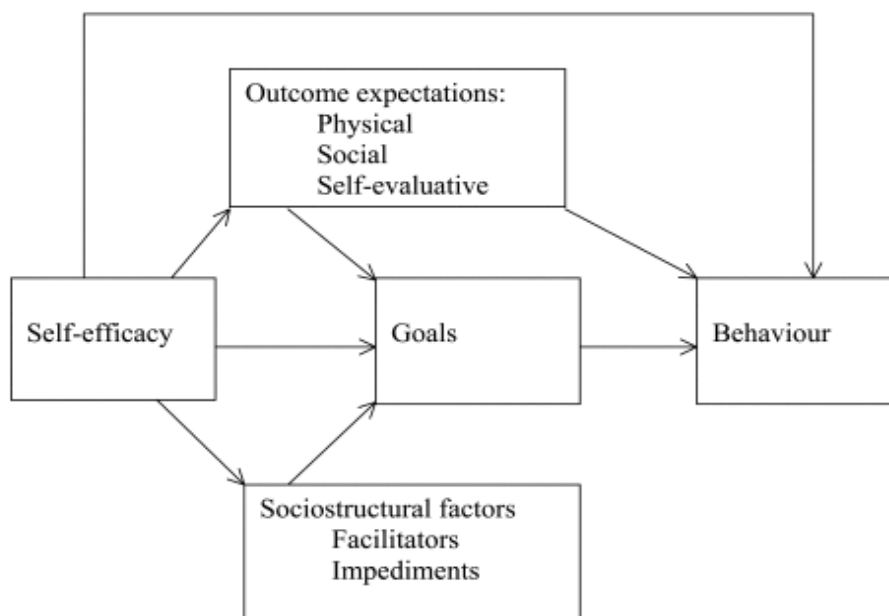
The experiments in this thesis address motivational processes, but not to the extent that would be appropriate for an end intervention. The main focus was on the two preceding process levels discussed, i.e., basic and enhanced stress-reduction mechanisms (sections 3.3 and 3.4). The social cognition model used to address participants' motivation to engage and persist in these stress-reduction activities was Bandura's (1986, 2001) social cognitive theory (SCT). The reason for this choice was that a core aim of the goal-momentum training was to enhance individuals' self-efficacy in pursuing goals and overcoming sources of stress. As self-efficacy is the core construct of social cognitive theory, it was deemed an appropriate choice. The model is illustrated in Figure 3.11 on the next page.

A review of social cognition models by Armitage & Conner (2000) highlighted that the 'self-efficacy' component of the SCT model was the dominant predictor of behaviour and suggested that self-efficacy may be more important than the SCT model itself. This is reflected by the fact that 'self-efficacy' is incorporated into other models, e.g., protection motivation theory (PMT; Rogers 1975, 1983); theory of planned behaviour (TPB; Ajzen, 1991); health action process approach (HAPA; Schwarzer, 1992). These models, however, were not selected as they included constructs deemed inappropriate for the present research.

Protection motivation theory (PMT), for example, features constructs relating to perceptions of susceptibility to, and severity of, health threats. Health threats associated with stress were not emphasized, however, for two reasons. Firstly, to avoid

possibly adding to the stress of already stressed participants. Secondly, to avoid stoking resistance from ‘gatekeepers’ possibly concerned that highlighting the impact of stress might fuel discontent amongst their workforce.

Figure 3.11 Illustration of SCT model (from Luszczynska & Schwarzer, 2005)



The theory of planned behaviour (TPB) includes a ‘subjective norms’ construct, which addresses a person’s beliefs about whether significant others think the person should engage in the behaviour in question. This may be a relevant variable where there are strong public opinions about behaviours, e.g., smoking or condom use. However, it was considered unlikely to be an influential factor in relation to writing activities, which can be performed without informing or affecting others.

The health action process approach (HAPA) is closely related to SCT. Armitage & Conner (2000) suggested it could be considered as superseding the SCT model. It is more comprehensive than the SCT model in that it addresses motivation, planning, initiation and maintenance of health behaviours. However, within the motivation phase it has a construct for risk perception, which raises similar issues to the health threats in the PMT model.

The SCT model was therefore retained. Although the model’s predictive power may be limited, the constructs were all at least compatible with the training emphasis, i.e., focusing on benefits rather than risks. They were also clearly relevant given their evident relationship to the core construct of self-efficacy, as specified by Bandura (1997). A further advantage was that Abraham & Michie (2008) specifically identified seven BCTs linked to SCT, which provided a systematic framework to follow. Table 3.1 on the next page outlines where the SCT related BCTs were applied in the intervention.

Table 3.1 SCT related BCTs used in design of pilot intervention for Study 1

Behaviour change technique	Where applied in intervention
Providing information on consequences	Manual – level 1 – Health benefits section.
Prompting intention formation	Manual – level 1 – Importance of practice section. Also supporting instruction sheets.
Prompting barrier identification	Manual – level 1 – Importance of practice section.
Providing general encouragement	Manual – levels 1, 2 and 3.
Setting graded tasks	Manual – level 2 – Tactical intelligence section.
Providing instruction	Manual – levels 2 and 3.
Modelling or demonstrating the behaviour	Manual – levels 1, 2 and 3.

Although the SCT model constructs posed no problems in terms of what to address, there was an operationalization issue stemming from the nature of the health behaviour rather than from the constructs themselves. The issue was that the health behaviour could be considered multi-layered in that the five core constructs of the SCT model could be applied not just to the act of writing, but also to the content of the writing and even to various levels within the content. Thus, for example, self-efficacy could refer to participants' beliefs simply about their ability to find the time to physically perform the writing activities. It could also refer to their beliefs about their ability to apply the SI, PI, TI self-regulatory skills. It could also refer to their beliefs about their capacity to achieve the goals they set for themselves within the writing activities.

Ideally, the aim should have been to assess relationships between constructs at each level. However, in practice these levels are likely to interact with each other. For example, a participant's success or failure in achieving particular end goals is likely to influence self-efficacy beliefs about general use of the self-regulatory skills, which in turn is likely to influence attitudes to performing the writing activities.

The approach adopted was ultimately a pragmatic one, based on the availability of validated self-report measures. As participants were likely to be pursuing a diverse array of goals, a general self-efficacy measure, Schwarzer & Jerusalem's (1995) generalized self-efficacy scale, was used. Participants' self-efficacy in using the various self-regulatory skills (i.e., SI/PI/TI) was not assessed, as no validated measures currently exist. The same applied to self-efficacy in respect of engaging in and persisting with the writing process. These issues (i.e., attitudes to writing and to

applying SI, PI, TI skill sets) were, however, addressed qualitatively using participant feedback.

3.6 Communication/presentation process

As the intervention was designed to be self-administered, clarity of presentation was extremely important. This section outlines the steps taken at this process level to try to ensure that the materials would be easily absorbed and understood.

Structure

1. The training manual was divided into three distinct levels to help readers navigate the materials more easily:
 - (i) *General Principles* – which explained the rationale for the writing activities;
 - (ii) *The Core Programme* – which described the writing activities;
 - (iii) *Extra Help* – which provided additional resources for optional use in the writing activities.
2. Key issues were repeated across the three levels to reinforce learning.
3. Core writing instructions for each activity were highlighted in coloured panels to make them more distinctive.
4. Where possible, descriptions for each activity, along with the relevant instruction panels, were encapsulated within a single page to provide a comprehensive snapshot of each activity.

Use of imagery and colour

1. Diagrams were used to illustrate key concepts, such as relationships between the three intelligence domains and stress as an imbalance between demands and resources.
2. The diagrams were in colour to make them more engaging.
3. The level three additional resource pages were printed on a different shade of paper (cream) to distinguish them from levels one and two.

Language

1. Language was kept relatively simple. The Flesch reading ease was 55.7 and the Flesch-Kincaid grade level was 9.4, which equate to approximately 14 years of age. It was therefore deemed well within the reading capacity of the public sector administrative staff who would be participating in the research.
2. The health messages were gain framed rather than loss framed, as the former appear to be more effective in promoting illness prevention behaviours (O'Keefe & Jensen, 2007). However, results can vary depending on the nature of the health behaviour and so this might be something to test in later follow-up studies.

3. Emphasis was on using lay terms, with no jargon or reference to theories.

Content

1. As the intervention was designed to test just one type of GSFC mechanism (i.e., goal momentum), the Figure 3.5 overview was not presented, to avoid prompting alternative mechanisms.
2. As explained in section 3.4, the three types of skill set (SI, PI and TI) were described as 'intelligences' to enhance their intellectual appeal. It was also hoped that they might undergo to a process of 'reification', as with, e.g., 'emotional intelligence' (Goleman, 1995).
3. As universities offer status and credibility as a message source, the Bath University logo was featured prominently in the training materials.
4. To limit possible extraneous influences from participants reading beyond the manual, no external references were used [e.g., Lazarus & Folkman's (1984) stress and coping theory].

There were limitations however. Though the manual was much shorter (29 pages) than, for example, a typical self-help book, there was a lot of information for readers to digest. The key aim, however, was to determine which activities and concepts were most helpful and which, if any, were problematic. Trying to encapsulate activities within a single page resulted in some appearing rather crowded, which may have been off-putting for some readers.

3.7 Conclusion

This chapter has outlined the various process levels and thinking underpinning the development of the main intervention in this thesis. Use of a logical framework, best practice guidelines, established theories and empirical evidence should have helped build a plausible intervention. However, there may have been key issues that the framework or theories failed to address, or problems with the way the theories were translated into practice. The next chapter, therefore, describes pilot testing of the intervention, used to assess the overall effectiveness and contribution of the various components.

CHAPTER 4: STUDY 1 – TESTING OF INTERVENTION PROTOTYPE

4.1 Introduction

The previous chapter drew on a range of psychological theories and concepts to create a prototype for a goal-momentum, stress-management intervention. Although the theories and models selected have a strong empirical evidence base, the challenge was to determine how best to combine and distil them into an optimally effective behaviour change writing intervention. To gain further insights, the prototype was tested with a target sample of participants. This was the focus of Study 1, which is described in this chapter.

4.1.1 Aims

The specific aims of Study 1 were to:

1. investigate participants' understanding and application of intervention concepts and activities;
2. investigate possible effects of the intervention;
3. investigate factors influencing participants' response to the intervention;
4. elicit participants' feedback regarding possible design improvements;
5. consider implications for the broader research and development process.

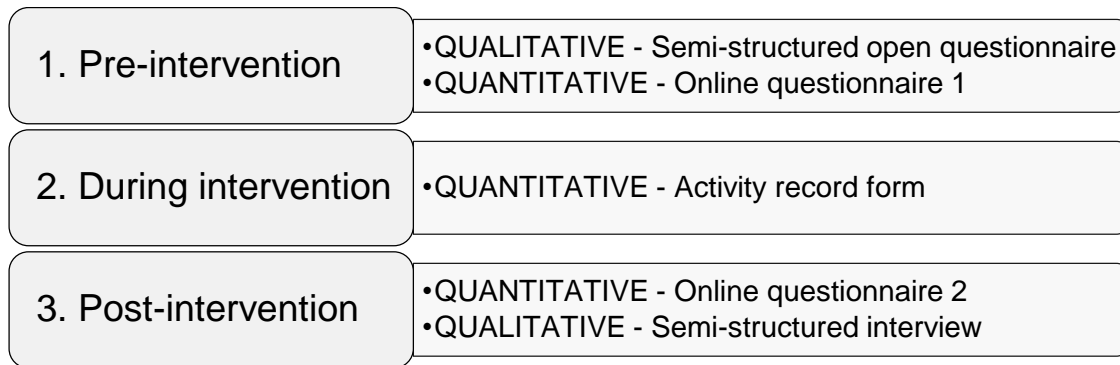
Though the intervention was designed to generate improvements on various measures of psychological well-being, there was no formal hypothesis testing, as the sample size was insufficient for inferential statistics.

4.2 Methods

4.2.1 Design

The study used a mixed methods concurrent triangulation design (Creswell, 2009). This involved collecting both qualitative and quantitative data pre- and post-intervention, as well as quantitative during (see Figure 4.1). In experimental terms, it could be described as a one-group pretest-posttest quasi-experimental design (Harris et al., 2006). As outlined in Chapter 6, this type of experimental design has numerous limitations for formal hypothesis testing. However, as stated above, formal hypothesis testing was not a priority at this stage.

Figure 4.1 Study 1: Stages and methods



Mixed methods research designs involve the integration of qualitative and quantitative data. A ‘concurrent’ design signifies that the qualitative and quantitative data are collected in parallel within a particular research stage. This was chosen, as it was envisaged that it would be less time consuming than a ‘sequential’ design, in which one type of data collection follows and builds on the analysis of another. Timing was a key practical consideration, given that there were three stages of data collection.

As both the qualitative and quantitative data were important in this study, a ‘triangulation’ design was used, as opposed to ‘embedded’, in which one type of data is considered secondary to the other. In concurrent triangulation designs, the data collection and analysis of each strand (i.e., qualitative and quantitative) are usually conducted separately. Integration then takes place at the final interpretation stage, with the two types of data providing different but complementary insights into the research topic (Creswell, 2009). This was the approach adopted in this study.

There were two areas in which triangulation was expected to be particularly useful. The first was in investigating the effects of the intervention, where it was anticipated that the qualitative data would add depth to and help explain any quantitative changes found post-intervention (Aim 2 above). The second was in identifying factors influencing intervention outcomes (Aim 3), where it was anticipated that the qualitative data might uncover possible moderators not addressed by the quantitative measures. Aims 1 and 4, investigating participants’ reactions to the intervention and their recommendations for improvement, were addressed solely qualitatively. Aim 5 involved a more general overview of the whole research process.

Figure 4.1 above shows the order in which the various methods were applied. In the first stage, the semi-structured open questionnaire, eliciting participants’ initial views, preceded the online psychometric scale-based questionnaire, as such scales have been shown to be capable of influencing cognitions, emotions and behaviours (French & Sutton, 2010). In the final stage, the semi-structured interview was conducted after

completion of the second online questionnaire to avoid discussions affecting final questionnaire responses.

4.2.2 Participants

The sampling approach adopted was stratified purposive convenience sampling (Teddle & Yu, 2007). The inclusion criteria were that participants should be full-time, office-based administrative staff, aged between 18 and 65 years. To avoid extreme differences in hierarchical position, employees in mid-range grades 3 to 7 of Bath University's 1 to 9 pay scale were targeted.

Although purposive sampling is by definition unrepresentative of a larger population, which limits generalization, it is commonly used in qualitative research when seeking to gain preliminary insights into particular issues. The element of stratification was introduced to achieve a mix of age and gender, as these factors may influence coping style (Folkman, Lazarus, Pimley, & Novacek, 1987; Stone & Neale, 1984). The specific aim was to recruit two men and two women within each of the following age ranges: under 35; 35 to 50; over 50 years.

The principle reasons for targeting office-based, administrative staff were that:

- They were considered likely to face a broader range of stressors, and thus be more representative of the general adult population, than for example students, who are commonly used for psychological research. Also, their daily work routines and stress levels across the year were expected to be relatively consistent compared to students, who for example have exams, long holidays and variable attendance requirements.
- Office workers were more likely to have the literacy skills required to complete the intervention than, for example, manual workers.
- Office working environments and tasks were expected to provide a relatively consistent experimental baseline in that they tend to involve similar daytime working hours and little physical exertion. This was particularly important for assessing daily cortisol patterns, addressed in Study 3 (see Chapter 8).
- The aim was also to target sectors with high stress levels and the education sector (i.e., university staff) was reported as having a relatively high prevalence of work-related stress (e.g., Health and Safety Executive, 2013).

4.2.3 Procedure

After ethical approval was granted for the study, the heads of a number of administrative departments within the University of Bath were contacted for permission to circulate an email requesting volunteers for the project. Those who responded to the email were sent a participant information sheet (Appendix C1) and a copy of the study consent form (Appendix C2). For those who wished to proceed, individual meetings were arranged to answer any questions and sign the consent form. They were also given a set of instructions for the study (Appendix C3).

Participants were then emailed an electronic copy of the open question form (Appendix C4) to complete. On returning this, they were emailed the link to the first online questionnaire (Appendix C5). When this had been completed, a meeting was arranged to hand over the training manual (Appendix C7) along with a set of instructions (Appendix C6) for starting the writing activities outlined in the manual.

Participants were required to complete three 20 minute writing sessions per week for four weeks. This corresponded to the standard timings used in Pennebaker's writing paradigm, but repeated each week for four weeks to try to encourage habit formation. At the end of each week, participants were required to email a weekly update using an activity record form (Appendix C8). At the end of four weeks' writing, they were asked to complete the second online questionnaire (Appendix C9), after which a meeting was arranged to conduct a follow-up interview.

4.2.4 Materials

The materials provided to participants consisted of the following:

1. Participant information sheet (Appendix C1)
2. Consent form (Appendix C2)
3. Study instructions (Appendix C3)
4. Open question form (Appendix C4)
5. Training activity summary instructions – getting started (Appendix C6)
6. A 29 page instruction manual (Appendix C7)
7. Writing activities record form (Appendix C8)

The pre- and post-intervention questionnaires (Appendices C5 and C9) were only available online and participants were not provided with the option of retaining a copy of their responses.

4.2.5 Measures

The measures are described below in the order in which they were presented to participants.

4.2.5.1 *Semi-structured open questionnaire (Appendix C4)*

This was sent out and returned electronically and consisted of six open questions addressing the following topics:

1. Stressors and perceived causes
2. Stress symptoms
3. Coping response and perceived effectiveness
4. Current priorities/concerns
5. Previous stress-management training
6. Outcome expectations for present study

The principal aim was to collect information that might subsequently help in predicting responses to the intervention. Given the 'goal momentum' focus, there was particular interest in the nature of participants' initial goals, priorities and concerns and their pre-existing ways of coping. No minimum or maximum word limits were set for responses. It was anticipated that the amount participants chose to write, might be a predictor of subsequent engagement.

4.2.5.2 *Online questionnaire 1 (Appendix C5)*

The questionnaire was devised and conducted using the Bristol Online Survey website (<https://www.survey.bris.ac.uk/>). It contained the standard self-report measurement scales outlined below. These addressed constructs identified in the models discussed in Chapter 3, plus some additional variables for testing as possible moderators of participant responses to the intervention. Wherever possible, short or shortened scales were used to limit participant burden.

1. Standard sociodemographic questions

The questions included gender, age, ethnic origin, marital status, living arrangements, education level and a range of work and health-related issues. They are shown in full in Appendix C5.

2. **Positive and Negative Emotional Style Scale (PNES)** – 12 items (Cohen, Alper, Doyle, Treanor, & Turner, 2006). This was used to assess positive and negative affect pre- and post-intervention. Participants were required to rate how accurately each of six positive and six negative adjectives described their feelings during the previous week, on a scale ranging from (1) not at all to (5) extremely (Appendix B2). The positive affect adjectives were: lively, full of pep,

happy, cheerful, at ease and calm. The six negative adjectives were: sad, unhappy, on edge, tense, hostile and angry. Positive and negative affect scores were calculated as the mean of the ratings for each of the six relevant adjectives. An advantage of the scale was that it was shorter than the 20 item Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988). Cohen et al. (2006) reported internal reliabilities ranging from .82 to .90 for positive affect and .83 to .90 for negative affect. In the present study, however, T1 (Time 1) Cronbach's α scores were .83 for positive affect and .16 for negative affect. The poor score for the latter was investigated. The six negative affect items were composed of the following three subcategories, which had much higher Cronbach's α scores: anxiety (on edge, tense; .82); hostility (hostile, angry; .83); depression (sad, unhappy; .88). However, in this small sample (10 participants), the negative affect internal reliability score appeared to be undermined by some participants rating elements of the different negative affect subcategories quite differently (e.g., on edge versus hostile). No great reliance was therefore placed on the negative affect scores within this particular study. (N.B. In Studies 2 and 3 the positive and negative affect internal reliabilities were all acceptable.)

The PNES scale was placed near the beginning of the questionnaire, as recommended by Johnston, French, Bonetti, & Johnston (2004), as completing questionnaires can be stressful and has been shown to lead to elevated scores when emotion scales are placed at the end.

3. **Perceived Stress Scale (PSS)** – 10 items (Cohen & Williamson, 1988). This scale was used pre- and post-intervention to assess the degree to which participants perceived their lives as stressful. The 10 items are shown in Appendix B3. Participants were required to rate, on a five-point scale, how often they had felt the way described by each item over the past week, ranging from (1) never to (5) very often. Items 4, 5, 7 and 8 were reverse coded and added to the remaining six items to produce a total 'perceived stress' score. Reliability for the 10 item scale has previously been calculated as $\alpha = .89$ by Roberti, Harrington, & Storch (2006), who also found support for both convergent and divergent validity of the scale. In this study the T1 score was $\alpha = .79$. A review by Lee (2012) found this 10 item version of the scale to have superior psychometric properties to alternative 4 and 14 item versions of the scale commonly used.

4. **Brief COPE** – 28 items (Carver, 1997). This scale was used pre-intervention to assess self-reported coping style. This shortened version of the full COPE (Carver et al., 1989) was used to reduce participant burden. It contains 14 subscales (shown in Appendix C11) each consisting of two items. The 28 items are shown in Appendix B12. Each was measured on a four-point scale ranging from (1) 'I usually don't do this at all' to 4 'I usually do this a lot'. The scoring for each subscale was calculated as the mean of the two relevant items. As indicated in Appendix C11, however, internal reliability varied considerably. This was not unexpected for a two item scale and the range was similar to that originally published by Carver (1997), also shown in Appendix C11. Variability has also been noted in aspects of validity. Yusoff, Low, & Yip (2010), for example, found evidence to support the discriminant validity of the active coping, planning and acceptance subscales, but not the other subscales. Further limitations of such coping inventories have already been highlighted in Chapter 2. It was included as such scales are conventionally used in coping research. However, due to the limitations, it was not used as a principal outcome measure, e.g., for testing hypotheses. Its main use was as a randomisation check for Study 3 (see Chapter 8).
5. **Self-Esteem Scale (SES)** – 10 items (Rosenberg, 1965). This scale was used to assess self-esteem pre- and post-intervention. Participants were required to rate the extent to which they agreed or disagreed with ten general statements about themselves (Appendix B14) using a four point scale, ranging from (1) strongly agree to (4) strongly disagree. Items 1, 3, 4, 7, 10 were reverse coded and added to the remaining 5 items to form a total self-esteem score. The scale has shown acceptable reliability in previous research ($\alpha = .73$; Laible, Carlo, & Roesch, 2004). The T1 score for this study was .93. Studies have also demonstrated support for the construct validity of the scale (e.g., Bagley, Bolitho, & Bertrand, 1997).
6. **Generalized Self-Efficacy Scale (GSE)** – 10 items (Schwarzer & Jerusalem, 1995). This scale was used to assess self-efficacy (i.e., optimistic self-beliefs about one's ability to cope successfully with general life demands) pre- and post-intervention. Participants were required to rate the extent to which each of ten statements (Appendix B5) was true about themselves, using a 4 point scale ranging from (1) not at all true to (4) exactly true. No items were reversed. The ten items were added to form a total self-efficacy score. Luszczynska, Gutiérrez-Doña, & Schwarzer (2005) reported numerous studies supporting the

construct validity of the GSE and Cronbach's α scores ranging from .79 to .90. The T1 score for this study was .86.

7. **Revised Life Orientation Test (LOT-R)** – 10 items (Scheier, Carver, & Bridges, 1994). This scale was used to assess dispositional optimism (i.e., having positive generalized outcome expectations about one's future) pre-intervention. Participants were required to rate the extent to which they agreed with ten statements (Appendix B7) using a 5 point scale, ranging from (1) disagree a lot to (5) agree a lot. Items 1, 4 and 10 were recoded so that higher scores reflected greater optimism and were added to items 3, 7 and 9 to derive a total score. Items 2, 5, 6 and 8 were 'filler' items and thus did not contribute to the scoring. Scheier et al. (1994) reported satisfactory predictive and discriminant validity of the scale and a Cronbach's α score of .78. The T1 score for this study was .83.
8. **Ten Item Personality Inventory (TIPI)** – 10 items (Gosling, Rentfrow, & Swann, 2003). To reduce participant burden, this scale was used pre-intervention as a short proxy measure for the 'Big Five' personality traits (McCrae & Costa, 1987). Participants were required to rate their agreement with ten pairs of self-descriptive adjectives (Appendix B9) using a 7 point scale, ranging from (1) disagree strongly to (7) agree strongly. Half the items (2, 4, 6, 8 and 10) were reversed and their scores added in the pairings indicated in Appendix C12. With just two items per trait, the authors acknowledged that their scale sacrificed some internal reliability compared to larger scales. However, they reported good support for the convergent and discriminant validity of the scale. Cronbach's α scores are shown in Appendix C12.
9. **Need for Cognition Scale (NCS – short form)** – 18 items (Cacioppo, Petty, & Feng Kao, 1984). This scale was used pre-intervention to measure participants' "tendency to engage in and enjoy effortful cognitive endeavours". It was considered that this might influence participant engagement and success in use of the intervention. Participants were required to rate their agreement with 18 statements (Appendix B15) using a 9 point scale, ranging from (1) very strong agreement to (9) very strong disagreement. Items 1, 2, 6, 10, 11, 13, 14, 15 and 18 were reverse scored and added to the sum of the remaining 9 items. Cacioppo et al. (1984) reported acceptable internal reliability ($\alpha = .90$). The Cronbach's α score in this study was .95. Cacioppo, Petty, Feinstein, & Jarvis (1996) reported good convergent and discriminant validity for the scale.

10. Goal-Oriented Subjective Status Scale (GOSS) – 6 items (Yardley & Dibb, 2007). This scale (Appendix B4) was used pre- and post-intervention to measure perceived progress towards goals. Participants were required to rate the extent to which they felt they were moving away from or towards their ideal situation in six life domains (i.e., family and friends, work, finances, social life and activities, physical health or well-being, emotional well-being). A 7 point scale was used, ranging from (-3) a large extent away to (+3) a large extent towards. The six items were then summed to produce an overall goal status score, ranging from minus 18 to plus 18.

The wording of the question differed slightly from that used by Yardley & Dibb (2007). They experimented with two different versions. The first was movement-based ('How quickly do you feel that you are moving towards or away...?'). The second was distance-based ('How near or far do you feel you are from your ideal state...?'). Neither, however, adequately captured the affect generation mechanism postulated by control theory. Though Scheier & Carver (2003) emphasized that movement is key, i.e., 'the rate of discrepancy reduction' (e.g., in a discrepancy reducing feedback loop), they further noted that the rate of progress in itself did not determine affect. What mattered was how the rate of progress compared to the relevant reference value. Thus, for example, for some goals a slow rate of progress may be acceptable and generate positive affect. The wording used for this study, therefore, retained 'movement', but sought to address comparison to a reference value by using the phrasing 'to what extent'. Thus, the phrasing used was: 'To what extent do you feel that you are moving away from or towards your ideal situation ... [with respect to each domain]?'.

The goal domains were also slightly modified for the present study. 'Spirituality' was removed, as it was not addressed by the intervention. 'Work' was added, as participants were all in full-time employment. 'Health (physical and emotional)' was split into two categories, 'physical health or well-being' and 'emotional well-being', as these can vary independently. Yardley & Dibb (2007) reported Cronbach's α scores for their movement-based and distanced-based scales as .81 and .82, respectively. For the version used in this study the T1 score was .77. They also reported acceptable concurrent validity for both of their scales.

11. Brief Interpersonal Support Evaluation List (ISEL) – 12 items (Cohen, Mermelstein, Kamarck, & Hoberman, 1985). This scale was used pre- and post-intervention to assess different aspects of perceived social support. Participants

were required to rate 12 statements (Appendix B8) using a 4 point scale, ranging from (1) definitely false to (4) definitely true. Items 1, 2, 7, 8, 11, 12 were reverse scored. The following three subscales were created by summing the items indicated below in brackets: Appraisal support – availability of people to confide in (2R, 4, 6, 11R); Belonging – availability of people to socialise with (1R, 5, 7R, 9); Tangible support – availability of physical help (3, 8R, 10, 12R). Previous studies have found good internal reliability, e.g., $\alpha = .90$ (Trevino et al., 2010). The Cronbach's α score for the overall scale in this study at T1 was .87. Cohen et al. (1985) reported that the scale demonstrated adequate concurrent and discriminant validity.

12. **Habit Index of Negative Thinking (HINT)** – 12 items (Verplanken, Friborg, Wang, Trafimow, & Woolf, 2007). This scale (shown in Appendix B6) was used pre- and post-intervention to assess the type and frequency/automaticity of stress-related thoughts. It was in two parts. The first part asked participants to write down typical thoughts, concerns or worries causing stress or anxiety, related to any area of life. For each worry noted, they were asked to rate the seriousness on a 5 point scale, ranging from (1) somewhat worrying to (5) extremely worrying. The second part addressed the habitual nature of such worries, with participants rating their agreement with 12 statements concerning how such thoughts generally come to mind, using a 5 point scale ranging from (1) strongly agree to (5) strongly disagree. The scores for these 12 items were summed to form a habitual index of negative thinking score. Verplanken et al. (2007) reported the scale showed high internal reliability (.94). The Cronbach's α score for T1 in this study was .93. Verplanken & Velsvik (2008) reported good construct and predictive validity for the scale.

4.2.5.3 Activities record form (Appendix C8)

This was completed and transmitted electronically by participants at the end of each writing week. It reported date, time and type of writing activity. This provided an indirect measure of participants' engagement in the activities. In this initial study there was no direct assessment of written output, as the priority had been to encourage participants to write freely about issues of concern to them.

4.2.5.4 Online questionnaire 2

This contained the following self-report measures, already described in section 4.2.5.2. Appendix B1 summarises the scales used in the pre- and post-intervention questionnaires.

1. **Positive and Negative Emotional Style Scale** (Cohen et al., 2006).
Cronbach's α scores for T2 were: positive affect .76; and negative affect .46.
See comments for T1 above.
2. **Perceived Stress Scale** (Cohen et al., 1983). Cronbach's α score for T2 was .86.
3. **Self-Esteem Scale** (Rosenberg, 1965). Cronbach's α score for T2 was .83.
4. **Generalized Self-Efficacy Scale** (Schwarzer & Jerusalem, 1995). Cronbach's α score for T2 was .83.
5. **Goal-Oriented Subjective Status Scale** (Yardley & Dibb, 2007). Cronbach's α score for T2 was .92.
6. **Brief Interpersonal Support Evaluation List** (Cohen et al. 1985). Cronbach's α score for T2 was .82.
7. **Habit Index of Negative Thinking** (Verplanken et al., 2007). Cronbach's α score for T2 was .91.

4.2.5.5 Semi-structured interviews

These were face-to-face interviews conducted by the sole researcher (SD). The interview schedule (Appendix C10) covered the following three main topic areas.

1. Feedback on general presentation of manual / initial reactions to the intervention
 - (i) General principles
 - (ii) The core programme
 - (iii) Appendix – extra help
2. Feedback on application of concepts and activities and perceived effects
 - (i) Stress model
 - (ii) Perceptual intelligence activities
 - (iii) Strategic intelligence activities
 - (iv) Tactical intelligence activities
 - a) Current signals – red
 - b) Current signals – amber
 - c) Current signals – green
 - d) Listing and organising tomorrow's actions
 - e) Problem rebalancing
 - f) Finding alternative routes

- g) Planning and rehearsing key actions
- (v) Appendix activities

3. Recommendations for future improvements

- (i) Facilitators/impediments to effectiveness/sustainability
 - a) Person-related
 - b) Context-related
- (ii) Possible design changes
- (iii) Participant issues, questions

4.2.6 Data preparation and analysis

4.2.6.1 *Quantitative self-report data*

The BOS survey data was exported in CSV (comma separated value) file format and then imported into SPSS, following the text import wizard instructions. Variable names were changed from BOS generated question numbers to scale item descriptors, which were then used in syntax commands to automatically calculate scale totals. For the scale items, there were no missing values as the scale elements of the questionnaires had been given a mandatory response setting, which prompted participants to return to any missed items.

Statistical analyses were conducted using SPSS Predictive Analytics Software (PASW) version 18. With just six participants completing the intervention, the sample size was too small to power any inferential statistical calculations. The emphasis, therefore, was on basic descriptive analysis, exploring the different scales and whether any appeared to register large changes between T1 and T2. The data was also scanned for possible distinctive patterns of results for participants with relatively high or low scores on any trait measures. Internal reliability was calculated for all scales, using Cronbach's α . Where reliability was low, scores were interpreted with particular caution.

4.2.6.2 *Qualitative analysis of interviews and open questionnaires*

Interviews with participants were digitally recorded and transcribed verbatim. The interview transcripts and open questionnaire responses were analysed using 'framework analysis' (Ritchie & Spencer, 1994). This method was chosen as it provides a systematic way of combining the analysis of pre-determined top-down themes (stemming from the structure of the intervention) and bottom-up themes (stemming from participant responses). Furthermore, the charting process provided a systematic way of trying to identify trends and patterns in the data (e.g., section 4.4.1.1). Five stages of framework analysis were applied in this study. They were:

1. Familiarisation with the data through repeated reading.

2. Identification of a thematic framework of themes and sub-themes. This was derived from a combination of three sources:
 - (i) a priori themes/issues stemming from the structure and content of the 3-i training manual;
 - (ii) emergent themes/issues raised by participants;
 - (iii) analytical themes arising from the researcher's interpretation of responses.
3. Indexing: The thematic framework was systematically applied to all the data, using NVIVO software version 9.
4. Charting: This involved extracting the data for each key theme and organising it in a tabular format showing the range of responses of all participants.
5. Mapping and interpretation: Participants were categorised according to their degree of engagement with the intervention. The main thrust of the analysis was to look for patterns of response in relation to these categories.

4.2.7 Ethics

Ethical approval was granted by the University of Bath Department of Psychology Ethics Committee (Ethics application: 11-888). Written consent was obtained from all participants before starting the study.

4.3 Quantitative results

4.3.1 Sample characteristics

Table 4.1 below summarises key sociodemographic variables. Ages ranged from 31 to 59 years. The recruitment target of two male and two female participants for each age group was not achieved for the under 35 year category, where just one female was recruited. The next youngest was a 38 year old male. The groupings below were therefore modified slightly to reflect this.

Table 4.1 Study 1: Sociodemographic characteristics by age category

Variable	Age range (years)						
	Under 39		39 to 50		Over 50		
Gender	1 F	1 M	2 F	2 M	2 F	2 M	
Job grade	G5	G7	G5 & 6	G6 & 7	G4 & 5	G7 & 8	
Education	A levels	Degree	Degree	Postgrad	A levels	O levels	
			Degree	Postgrad	Degree	Postgrad	
Marital status	Neither married		3 / 4 Married		All married		
Children	No		1 M yes		1 M & 1 F yes		
Ethnicity	All white – 9 / 10 British						

4.3.2 Attrition and writing task adherence

Attrition

Table 4.2 below shows the attrition at various stages. Overall, 80 per cent of the women and 40 per cent of the men attempted all aspects of the intervention.

Table 4.2 Study 1: Participant attrition by gender

Activity	Female	Male	Total
Completed open questionnaire	5	5	10
Completed online questionnaire 1	5	5	10
Collected training manual	5	4	9
Began writing activities	4	2	6
Completed online questionnaire 2	4	4*	8
Completed final interview	4	4*	8

* Two men (both over 50) failed to start writing activities but agreed to follow-up assessment.

Adherence

Table 4.3 below shows the number of writing sessions, total duration and types of activities attempted by the six participants who engaged in the writing activities. They are ranked according to the number of sessions reported and further differentiated by total writing time. All participants reported completing activities B (strategic intelligence), 1 (current signals), 2 (listing/organising actions), and 3 (problem rebalancing). Although two participants (011, 020) did not report using activity A (challenging perceptions) as a stand-alone activity, in the follow-up interview they both confirmed using these skills as part of activity 1 R (red). The average writing frequency was two to three sessions per week. Average writing duration per session was approximately 29 minutes.

Table 4.3 Study 1: Participant-reported writing activities

Participant	Male/ Female	Total writing sessions	Total writing minutes	Writing activities attempted
021	F	12	347	A, B, 1R, A, G, 2, 3, 4, 5
020	M	12	285	B, 1, 2, 3, 4, 5
011	F	10	250	B, 1, 2, 3, 4, 5
016	M	10	226	A, B, 1R, 2, 3
010	F	9	340	A, B, 1R, 2, 3, 4
012	F	7	287	A, B, 1R, 2, 3

Writing activity codes: A) Challenging perceptions; B) Choosing/pursing goals; 1) Current signals (Red, Green or Amber); 2) Listing/organising actions; 3) Problem rebalancing; 4) Finding alternative routes; 5) Planning & rehearsing key actions.

To facilitate the search for possible trends in the data, participants were grouped into four categories, ranging from minimum to maximum engagement, as shown in Table 4.4 below.

Table 4.4 Study 1: Categories of participant engagement

Category	Participants	Engagement with intervention
1	014, 015	None
2	018, 019	Read manual but did not do activities
3	012, 010, 016, 011, 020	Read manual and tried a range of activities
4	021	Read manual and tried all activities

4.3.3 Intervention impact on outcome variables

Table 4.5 on the next page shows the changes in self-report measures of psychological well-being for the eight participants who completed online questionnaires 1 and 2. As previously stated, the study was not designed or powered to generate inferential statistics about the likely effects of the intervention on the broader population from which the participants were sampled. The priority was to obtain individual feedback from each participant to help to refine the pilot intervention for Study 2 and to generate hypotheses about possible moderators of outcomes. The quantitative analysis was therefore idiographic rather than nomothetic, i.e., used as a series of individual case studies or N-of-1 trials (e.g., Sniehotta, Presseau, Hobbs, & Araújo-Soares, 2012) to explore different possible outcomes and issues arising from each individual's experience of the intervention. The results are grouped according to the participant engagement categories shown in Table 4.4.

Participant 021 (category 4), the one person who engaged with all the activities, appeared to show distinct improvements across a range of outcome measures. These included: increases in positive affect, work-related goal progress, overall goal progress and reductions in negative affect, perceived stress, and habitual negative thoughts.

Results were mixed for the moderate engagement category 3 participants. On the positive side, four out of five appeared to show improvements on work-related goals. On the negative side, four out of five showed adverse changes in self-esteem, self-efficacy, and perceived stress. They were not the same four for each variable.

For the category 2 participants, who only read the manual, both had slightly improved scores for positive affect, negative affect, self-efficacy, perceived stress, and habitual negative thoughts. However, these changes appeared quite marginal, apart from participant 19's negative affect and habitual negative thought reductions and participant 18's perceived stress reduction.

Table 4.5 Study 1: T1-T2 changes in self-report measures of psychological well-being

Variable	Category							
	2	2	3	3	3	3	3	4
	Participant							
	018	019	012	010	016	011	020	021
Positive affect T1	3.67	3.50	2.50	3.17	3.33	2.83	3.50	2.67
Positive affect T2	3.83	3.67	3.33	3.00	2.50	3.33	3.67	3.67
Negative affect T1*	2.00	2.83	2.17	2.67	2.50	1.67	2.50	2.83
Negative affect T2*	1.83	1.83	2.33	2.33	2.50	1.50	2.50	1.50
Self-esteem T1	40	30	32	35	30	36	28	34
Self-esteem T2	37	31	30	25	25	30	30	39
Self-efficacy T1	37	30	34	34	31	35	30	35
Self-efficacy T2	39	31	32	30	29	30	31	36
Perceived stress T1	27	28	32	34	31	30	27	38
Perceived stress T2	21	26	40	38	37	28	29	24
Work goals T1	3	2	1	-3	1	-1	1	1
Work goals T2	3	1	-1	-1	2	0	2	3
Total goals T1	14	12	-1	-2	4	9	2	3
Total goals T2	14	11	-7	-2	0	8	6	12
Habit index (HINT) T1	30	45	52	46	54	35	39	52
Habit index (HINT) T2	26	23	29	47	56	32	37	36

* Data possibly unreliable due to low Cronbach's α score for this variable.

4.3.4 Person-related moderating factors

This section addresses possible person-related moderators covered by the quantitative measures used in the online questionnaires. Environment- or context-related factors are addressed in the qualitative results section (4.4) along with other possible person-related factors. Table 4.6 on the next page shows the baseline scores for the ten participants who completed online questionnaire 1. For scales with multiple subcomponents, such as the COPE (coping styles), GOSS (goal domains) and TIPI (personality traits), only relevant subcomponents (i.e., those with a discernible pattern of results) are shown.

Category 1 participants, who did not engage with the intervention at all, had the lowest scores on self-esteem, self-efficacy and total goal progress. This might, for example, suggest that this type of self-administered intervention may be inappropriate for people with low starting levels of self-efficacy. They also had the lowest emotional stability scores, apart from participant 21 at the opposite end of the engagement continuum. Participant 014 in particular had the most extreme scores on 12 out of the 21 variables listed in Table 4.6 and was equal most extreme on a further three.

Category 2 participants, who read the intervention but did not do any writing activities, were both male and the oldest (58 and 59). They also had the highest scores on total goal progress. Participant 018 had the highest scores for self-esteem, self-efficacy, optimism, planning, need for cognition and total goal progress, and the lowest for habitual negative thought, equal lowest for perceived stress and equal highest for extraversion and openness to experience. This individual, therefore, may have been motivated more by curiosity than stress.

Category 3 participants (moderate engagement) constituted the largest group. There appeared to be nothing particularly unique or distinctive about their scores as a whole.

Category 4 participant 021, who engaged fully, was the lowest on emotional stability and tangible social support, equal highest on extraversion and openness to experience and second highest on need for cognition. [N.B. Although the 'openness to experience' scale was particularly poor in terms of internal reliability, as participants 021 and 018 both had maximum scores (i.e., 14), they at least would have rated the relevant scale items consistently.]

Further possible person-related moderators are addressed in the next section. Interpretations of these findings are discussed in section 4.5.

Table 4.6 Study 1: T1 scores for self-report measures of psychological well-being

Variable	Category									
	1	1	2	2	3	3	3	3	3	4
	014	015	018	019	012	010	016	011	020	021
Positive affect T1	1.33	4.17	3.67	3.50	2.50	3.17	3.33	2.83	3.50	2.67
Negative affect T1*	3.00	2.33	2.00	2.83	2.17	2.67	2.50	1.67	2.50	2.83
Self-esteem T1	17	18	40	30	32	35	30	36	28	34
Self-efficacy T1	20	26	37	30	34	34	31	35	30	35
Optimism	16	20	30	16	26	16	21	24	21	22
Perceived stress T1	45	27	27	28	32	34	31	30	27	38
Active coping	2.0	3.0	4.0	3.0	4.0	4.0	2.5	2.5	2.5	4.0
Planning*	3.0	2.5	4.0	3.0	3.0	3.5	3.0	3.0	2.5	3.0
Reinter-pretation	1.0	3.0	2.0	3.0	2.0	3.5	2.5	2.0	3.0	2.5
Distraction*	1.0	4.0	2.5	3.5	2.5	2.5	3.0	2.0	3.0	2.5
Acceptance*	3.0	3.0	2.5	3.0	4.0	1.0	3.5	2.0	3.5	2.0
Appraisal ISEL T1	2.75	2.25	3.75	3.25	2.75	4.00	3.25	4.00	2.00	3.25
Belonging ISEL T1	2.50	1.50	3.25	3.75	4.00	3.50	3.50	3.50	2.25	2.00
Tangible ISEL T1	2.50	3.00	3.75	3.25	3.50	3.50	3.75	3.25	3.00	1.00
Need for cognition	60	118	154	109	86	101	132	111	115	151
Work goals T1	-3	-3	3	2	1	-3	1	-1	1	1
Total goals T1	-7	-7	14	12	-1	-2	4	9	2	3
Habit index T1	59	52	30	45	52	46	54	35	39	52
Emotional stability	4	4	13	11	14	7	12	12	7	3
Extraversion	3	10	14	10	10	8	12	9	3	14
Openness*	6	9	14	11	12	13	11	12	12	14

* Data possibly unreliable due to low Cronbach's α score for this variable.

4.4 Qualitative results

4.4.1 Pre-intervention open questionnaire data

This section outlines the key findings from the framework analysis applied to participants' written answers to the initial semi-structured open questionnaire. This was based on ten participants.

4.4.1.1 Person-related qualitative moderating factors

Stated starting goals

Table 4.7 below shows participants arranged in order of intervention engagement set against their stated priorities/concerns pre-intervention. The latter are arranged in order of perceived ease of progress using the 3-i intervention. The logic underpinning the ranking was that progress should have been easier the more specific/concrete the goal and the more within an individual's personal realm of control. This ranking, however, was only an approximation, as ease of progress can clearly differ greatly from one context to another.

Table 4.7 Study 1: Stated goal priorities (pre-intervention)

Priorities/concerns	Category									
	1	1	2	2	3	3	3	3	3	4
	Participant									
	014	015	018	019	012	010	016	011	020	021
Priorities no concerns			X							
Clear constructive goals										X
Personal process goals	X					X	X	X		
Minor 'hygiene' goals					X					
Indecision – minor choice				X						
Future task – time concerns		X			X		X	X	X	X
Concern for self-image				X						
Concern for health – self	X							X		
Concern for health – other				X	X			X		

No general trends were apparent across the data. Individually, the category 4 participant with maximum engagement was the sole participant to set out concrete goals and a particular time frame to resolve explicit issues. The participant wrote:

We are trying to work on a long-term plan for establishing my job role properly within my Department and also looking into how I can be moved into an office closer to the main campus to receive the support of other Administrators and lessen the isolation. These two matters are vitally important to my future happiness in this particular role [...] I am anxious about this as I desperately want this all sorting so that at the start of the new

academic year there are clear boundaries and expectations in place between myself and the staff I work with in my building. [P021]

Thus, the intervention may have been particularly compatible with her pre-existing frame of thinking.

A further point to note is that participant 018, who indicated no signs of stress on self-report measures, only listed priorities and no personal goal concerns. This again perhaps helps explain his failure to engage in the writing activities. The other person in category 2, i.e., 019, was the only participant to write about problems of indecision and concern for self-image. The former may have undermined his motivation to engage in the training. Also, the latter was perhaps one of the more challenging issues for the intervention to address.

Initial writing effort

Table 4.8 below shows how much each participant wrote in response to the initial open questionnaire. Word count appeared to be predictive in the extremes, i.e., for participants 015 and 021. However, not in the middle ranges. For example, participant 014 wrote a similar amount to category 2 participants, who wrote more than some category 3 participants.

Table 4.8 Study 1: Word counts of participant replies to open questionnaire (pre-intervention)

Variable	Category									
	1	1	2	2	3	3	3	3	3	4
Participant	015	014	018	019	012	010	016	011	020	021
Total word length	352	510	545	586	388	605	638	978	478	1951

4.4.2 Post-intervention interview data

4.4.2.1 Understanding and application of concepts

The results reported in this section are derived from the framework analysis of final interview transcripts (8 participants).

General reaction to intervention

All participants commented that there was too much volume of information. There was a mix of responses as to whether the information was too complex. The need for cognition scores were checked for a possible bearing on this. Those with the highest need for cognition scores did not think it was too complex. The participant (014) with the lowest need for cognition score withdrew from the study. The participant (012) with

the second lowest need for cognition score benefited from individual components of the intervention, but appeared unclear about the overall structure.

I wasn't sure why there was A's and B's and one's to five. [P012]

Two participants reported struggling with the systematic nature of the intervention. One would have preferred a more unstructured visual approach.

I mean the way I do it is, I mean if I was doing my life goals, I would just get an enormous piece of paper and just randomly all over the place write down all the things I wanted to do. And then I'd start circling ones I thought were more important or grouping them ... you know ... Oh that one's very similar to that one ... let's put, you know ... cut them out. And then I'd cut them all out and stick them together in a different way and I'd make a pattern out of them. [P010]

The other found writing out his thoughts difficult.

I think ... writing it down was too, you know, prescriptive, it was, it was ... it was choking me rather than helping me sort of, you know [...] a sentence is not something I'm comfortable with ... of writing down ... like I say by the time you got to the end of the sentence, I've, I've gone half a dozen different ideas ... it ... it [laughs]. It would slow me down. [P019]

Thus, information processing style may have been an issue for some. The remainder of the participants, however, reported no difficulty following the structured writing approach.

Level 1 – General principles

Participants were generally positive about this first part of the manual and the way in which the information was presented, i.e., under question headings.

Stress concept

Participants generally found the 'Imbalance of demands versus resources' diagram (page 8 of the manual – Appendix C7) helpful and thought it made sense, particularly for task-related stress. They did not conceive of all types of stress in this way however.

That's how I think of certain types of stress, yes, but I wouldn't ... necessarily ... think that all types of stress are due to demands outweighing resources. [P011]

People-related problems were cited by some as not appearing to fit with this stress model.

I mean some of the things I feel that aren't so good, I would say are to do with my thoughts about certain people ... problems I have with people ... [Laughs] generally and in particular ... um ... but I wouldn't necessarily put that under stress, you know, but I

sometimes get and sometimes I might get invasive thoughts about things ... invasive very slightly paranoid thoughts ... but I wouldn't put those under the stress. [P020]

Perceptual intelligence

None of the participants appeared to have any problem grasping the general concept. However, one suggested that perceptual intelligence was difficult to achieve, working through the writing activities alone, i.e., without some kind of expert or third party help.

The challenging perceptions I think you need to have somebody else because it's always other people who can give you that little bit of insight into yourself. [P010]

Despite this, participants did report shifting perceptions on their own and there may have been some areas where this was easier to achieve than others. For example, there appeared to be more scope with less familiar and more complex task-related problems.

A lot of the things that are coming up, I don't actually know. They loom large in my mind. I've got to do the [name of publication] for four [organisational groupings]. In my mind that's huge, but ... in actual fact, when I stopped and thought through, a lot of the stuff is um ... sort of centrally driven. So a lot of it is cutting and pasting their centrally driven things in and actually an email round to [groups of work colleagues] asking them to update their bits and then collating it all ... So it probably isn't going to take me as much time as, in my mind, I think it's going to. [P012]

Conversely, with perhaps more familiar straightforward tasks, perceptual intelligence may have been more difficult to apply.

In my case some of the problems are so glaringly obvious that there's not very many ... much wriggle room there. [P016]

With people-related problems, however, it appeared to work quite well. For example:

I was dreading a meeting with a particular [work colleague] and I sort of worked through that challenging perceptions and it did help with that [...] I realised that I was actually being quite biased in my way of thinking about that meeting as well, because my introduction to this person had been under quite poor circumstances. [P012]

Also:

And my initial thought was ... someone's querying ... my work. Um ... and basically saying I've made a mistake. And ... rather than storming in and saying I didn't make a mistake, you know, here's ... you know, here's what I ... here's what I did ... I went and talked to them and I asked why um ... they'd asked me this and it transpired there was a bigger issue going on and they were having to check on several um [work-related documentation] to find out what was going on with [work-related issue]. [P011]

A comment from a participant who did not manage to successfully apply the concept, however, highlighted a possible misconception that it may be necessary to guard against, i.e., an apparent confusion or blurring with 'positive thinking', as opposed to more 'balanced thinking'.

You know ... there wasn't really ... I couldn't think of much sort of perceptual wriggle room on that one ... and to kind of redefine it in a more rosy glow [laughs]. [P016]

Strategic intelligence

This involved a number of goal-related concepts. The instructions in the main section (level 2) of the manual focused on the notions of a goal hierarchy, life domains, and the distinction between primary and secondary goals. Again, participants appeared to understand the concepts, but some encountered problems when trying to apply them. Several participants, for example, claimed not to have any explicit goals.

I'm more reactive. I don't ... I don't ... think I've got goals. I'm not that type of person. I just prefer to just keep on going, you know, chipping away ... [P019]

I'm quite um ... what's the word? Um ... what'll happen will happen, in kind ... kind of in terms of my life. You know, I haven't planned ... to have um a particular family life. I haven't planned to live in a particular place. I haven't planned ... really so much or early on I didn't plan a career. You know, I um ... I kind of take ... take what ... not take what comes, but um ... see what ... see what comes along in a way. [P011]

I've never been really big on goals. I mean I've never seemed to have much sort of ambition for ... to do ... you know ... having my sights set on some high flying career or something. I kind of ... my, my career has just sort of kind of happened and you know ... I like my job and things but ... it ... I've never ... I've never really had a plan for that. [P016]

This highlighted a key issue of task artificiality/relevance.

I think it's good to think about it, but I think there was possibly a point where I started just sort of scraping around for goals just cos I felt I didn't have enough to complete the exercise sort of thing ... and having arbitrary or artificial goals on your list doesn't really help anything because you don't really care whether you achieve them or not. [P016]

Also, participants tended to focus on smaller, more immediate rather than strategic issues.

I just scribbled stuff down. I mean I wrote, you know, I just wrote ... but I do feel I was ... it was quite short termism what I was doing. It wasn't particularly profound. [P016]

The absence of strategic goals led to problems creating a goal hierarchy.

But then when you have to sort of split it down into multiple tiers or primary and secondary and stuff, if you don't start with a fairly big goal, it feels it's hard to sort of chop up so [inaudible] so ... cos one or two of the primary goals I did pick were ... a bit more mundane, but then finding secondary goals to fit under them was ... was, you know ... a bit random. [P016]

This led in some cases to the misrepresentation of what might be considered secondary goals as primary. For example:

So I thought right so ... my goal ... my primary goal ... well my primary goal is going to be make sure I go for a swim at lunch times. [P012]

Nevertheless, the concepts were applied effectively on numerous occasions. For example, the same participant 012 applied the primary/secondary distinction as instructed to the goal of developing confidence.

I started off with primary goals. I was saying, 'Right OK, what ...' I think I was putting it on ... I wasn't putting it on, 'I must do this by this week.' I was putting it on more of a level of, 'I'd like to build my confidence, I'd like to be ... respected for ... what I can do in my job' and things like that. [...] Secondary goals were things like to stop apologising. I always say, 'It's only me' and, you know ... 'Sorry about this, but ...' when it's actually not something that I've ... It's probably that time-tabling have said, 'You can't have that room' and I'm apologising for it. Things like ... and I ... I should stop apologising unless it is actually something that I've done [laughs]. So those ... secondary goals um ... being able to ... criticise constructively. [P012]

Whatever way participants applied the concepts, the consensus was that the activity was beneficial, principally through making goals more explicit.

I mean I guess it did make me think about ... sort of the things I'm after ... which I probably hadn't done in any great clarity before. [P016].

It highlighted that I've got so bogged down in in in the last however long work thing that I'd lost sight of the rest of my life. [P010].

And also through making goals more realistic.

If I want something ... a goal ... I'll think about it and ... and the first thing I'll ask myself now ... is that unrealistic. Do I need to really rethink that goal to make it more achievable and ... or perhaps slightly different. Um ... and that's alleviated a lot of my stress, because ... um you know, even coming up with goals for myself is a nightmare, because I just don't know what I want ... and I ... again there's no structure to that thinking process. So that's the best thing I've got out of this. [P021].

There was no evidence, however, of participants making significant strategic changes to the nature of their goals.

I'm not sure it's particularly changed my goals, but um ... it's ... it's possibly made me think about ... the balance a bit in ter ... just sort of ... working, you know, work and doing a bit of soul searching. [P016]

This may have been due in part to the fact that information on 'goal types' was situated in the level 3 extra help section, which most participants only skimmed. Consequently, the potential was perhaps not fully tested. The one participant who did read this section carefully appeared to find some of the ideas quite appealing. For example:

There was an example that really stuck in my mind about setting goals as well, there was a bit that said, you know, if you, if you set yourself a goal of, you know, you want to learn to play the guitar and you want to become a famous guitar player and changing your perception of thinking well, you know, instead of looking at it and wanting something so abstract and unrealistic, instead think of it as I want to play the guitar well. How can I achieve that and play well for myself, in the hope that it might lead to something else. [P021]

Finally, though participants were able to address any type of goal or problem, their focus tended to be on work and particularly task-related goals. Two participants suggested more personal people-related goals/problems were perhaps too difficult to address.

I don't know, just resolving like ... an issue I have with my [close relative], for example, you know, that would be something that would be ... but I think I ... I think for me personally, I think I'm better off setting myself little achievable goals rather than a big goal that um ... is too ... it's just too big. [P011]

Researcher: *You've obviously applied this to work, but it's a kind of whole life thing. Could you see how you could apply it in your home life as well?*

Participant: *Yes I think that would be harder, cos that's the more emotional side of things, isn't it? And that's the bit that you find, or I would find more difficult. [P012]*

Tactical intelligence

Current signals – General

The traffic light metaphor was widely understood, though in one case slightly misapplied.

I probably misunderstood it at first cos I thought even though I'd read it ... red was stop and think about how you're reacting and then amber ... have a little bit more time

thinking and then think about what you're going to say and then like 'thinking-noting-doing', um you see and then the green was right OK now do that thing that you've just thought of, that's the better response [laughs]. And then I kept going. I'm sure I've got this a bit wrong. [P010]

Current signals - Red

This appeared to work well, helping participants become more aware of stress mechanisms and the impact on their emotions. For example:

It's not something that I would have normally done, no, so just doing that in itself was requiring me to stop and think about a range of emotions I'd had over different things throughout the day. Um ... and ... it ... it was great because I actually realised that sometimes the emotion reactions I was experiencing were making me stressed and I'd never realised before that just feeling a little bit ... um ... frustrated would then build and build into complete stress or feeling angry about a little thing. But then having lots of little things impact on that anger and it just got bigger and bigger. And then I didn't realise that that was stress. I would never have said anger and stress were the same thing before. This made me realise that perhaps they were. [P021]

Participant: *I thought it was quite a useful way, in a way of ... looking at stuff, you know, looking at your life and, you know, even just looking at your day ... and ... actually making it easier even if it was like a bad day ... making that easier to accept. [P020]*

Researcher: *How did that make it easier to accept then?*

Participant: *Almost, well almost by, you know, almost by I guess, in a way, almost by giving it that label ... And two, possibly itemizing some of the reasons that, you know, ways [inaudible] that happened ... why that might have happened. And then maybe going on from there and planning the next few days and giving goals for the next few days. [P020]*

Current signals - Amber

Only one participant (021) tackled this activity, but she found it useful.

A couple of examples that I remember having on the amber days, where work was fairly quiet, there hadn't been a lot going on. I hadn't particularly done anything fantastic throughout the day. Um and I was probably building up to a very quiet, you know, weekend and stuff. And um ... it was just thi ... again thinking about what I could do to make something a little bit more fun or interesting or make a tiny little improvement somewhere to flip that to make it more positive. [P021]

Current signals - Green

Though all participants reported being able to see the point of the 'red' activity, it was not so evident for the green.

I didn't see the point of that [...] cos if it's gone well, it's gone well. It's great. It's the things that you sort of want to investigate more that haven't gone well [laughs]. [P010]

I suppose I wouldn't get round to reflecting on it. If it went well, then that's fine, that's the end of it [laughs]. [P012]

Where it was applied, however, it appeared to enhance self-esteem.

It just made me stop and go wow ... I did good. I'm really proud of myself. And that appreciation of myself, I just ... it made me feel so good, because I thought wow I've really worked hard and I've earned this, you know. And it could have been something really silly, like I handled that situation yesterday really really well. It was that appreciation and I ... I think I'm a person that's very hard on myself and I don't often give myself praise. And I certainly don't feel pleased with myself on a regular basis. [P021]

Listing and organising tomorrow's actions

This was the core activity for most participants. Part of the appeal appeared to be that it built on and extended existing habits or practices.

I do make lists a lot ... and so that was the easiest one for me to start with. And I found that brilliant because it wasn't just making a list as I would normally do it, it was actually making me think about different things that would help with that list and with actually planning the workload. [P012]

Also, there was clear evidence that participants were able to think beyond simple 'to do lists', for example, improving the scheduling of their work.

So the only two hours that I've got without any interruptions and things other than the phone are between eight and ten. So I started planning the workload so that when I come in, in the morning I start by doing the primary goal rather than even turning my emails on and looking at them, because my normal habit was to come in, turn the emails on, look at them, make a cup of coffee, sit down, start going through the emails. Well that could take two hours, cos there'd be all sorts of queries that needed answering and things that needed following up and they'd lead onto other things. And I wouldn't actually even be approaching the things I had to do in the background, until sort of lunchtime. So that was another really key thing [laughs], helped a lot, so ... now I do this first. [P012]

Benefits included a greater sense of achievement and control.

But on a couple of days when I did that I did actually get more done than I otherwise would have done. So that, that felt quite good. [P016]

It actually felt so much better to ... feel as if I was taking some control over the whole situation. [P021]

A key issue emerged, however, regarding 'control' that had not been explicitly addressed by the intervention, namely, the issue of how to overcome one's non-rational impulses, for example, when trying to implement a plan.

The other big problem with that is that I ... err ... I seem to have a a problem with my, my Sky box in that it's always overflowing and there's always something needs watching and ... it's got a bit crazy and there, the number of hours of TV I'm watching ... and I'm aware of that, but I seem incapable of actually doing anything about it. So I can plan my way, you know ... to the, to the moon and back and ... and there's a say ... that that was the other thing I was gonna say actually. It's ... I felt that there was maybe room for another activity, addressing ... sort of that kind of thing, where if you've ... addiction to destructive behaviours or something that's a ... because this ... this is all in some ways coming from a sort of more rational place than that. Um that and my problem was more the fact that I know I've got all these things to do and I should be doing them, but my Sky box is full and I have to watch six hours of TV tonight, otherwise it's going to overflow and ... [laughs] um and so ... and and, therefore, enjoying the challenge in that was like well I should turn off the bloody TV but I can't [laughs] kind of thing. [P016]

Or trying to implement a plan at the optimal time.

And ... I kind of put it off, I put on the washing, you know, the washing machine, I vacuumed the house. I went and did something else. And my husband said, 'Oh aren't you going to call the ... you know ... [name of company]?' I said, 'Yes, but I've got to be in the right space.' I got myself in the right space. I got myself all ready, I got my documents. I had it all. I had my laptop open with the emails, you know, blah, blah. Phoned him up. He wasn't there. Didn't get resolved. Still haven't spoken to him today. You know. It's like, so I've got that hanging over me, whereas probably if I'd phoned him first thing on Friday morning last week, I ... I might not be happy, but I would be further forward. [P011]

Problem rebalancing

The concept was generally well understood and applied.

That was probably one of the easiest things for me to work through, because um ... it was ... it was really clear and it gave some ... some good ... um instructions and it ... it gave a great way um ... how explain it ... it was very well broken down, I thought and ... I think I've said before when I've got a problem I tend to look at it as a massive problem. And this made me think about all the different factors involved in a problem. And that a problem just doesn't have one part. It's got several. So that was all new to me. And I found that quite fascinating actually. [P021]

It appeared particularly useful in making participants aware of pressures arising from their own internal demands.

I started off with internal demands ... um ... satisfying as opposed to maximising, compromise, so I think sort of reading through that made me realise that I was trying to ... I was trying to do everything ... and when I reflected on it ... [turning pages] ... I'm going through this ... that had actually come up some years ago, at one of the performance appraisals that ... I was ... I was never having enough time to do things, because I was trying to do things too perfectly. [P012]

One participant also applied it particularly well to rebalancing external demands and resources.

It has worked perfectly, because it's really ... reduced the demands on me. And a very classic example of a ... a typical problem that drives administrators nuts is anything that goes wrong with photocopiers, printers or faxes or scanners [...] People will frequently come into an administrator's office and go, 'The photocopier's not working.' And then expect you to answer and to say something about sorting it out. And that drives people crazy, because it's the one thing that you don't want interrupting your day [...] So I actually, through doing this exercise and thinking of a way of dealing with it, I was able to find out ... it ... it actually made me think about it very logically. So I thought OK well, I don't want people coming into me anymore, because it's really stressing me out and and ... and wasting my time during the working day. There must be a service that ... that someone must look after this machine. OK found out that yes, managed print services now look after our new photocopier. Great ... um so I distributed the information amongst people, but that didn't initially stop people from coming in when there was a problem. So I had to take it a step further and review the situation and think, they've been given the information, I've made it clear to them, but they're still coming into me. The problem isn't solved. What now? And I had to then think beyond that. Ok, well how about putting some signs up, in the photocopier room, on the notice board, that are nice and clear, big print, with a phone number and an email address and some instructions. And I think that did the trick. [P021]

Finding alternative routes

This was perhaps more difficult to exploit, as it relied heavily on use of a goal hierarchy and the distinction between primary and secondary goals, which as noted above was problematic for some. Again, however, the one person who managed to use it effectively was participant 021.

And one of the things that makes me feel quite sad sometimes is that I don't have a social life here in Bath. Um ... so one of these goal types was what was happening was ... I was getting disappointed and upset with my friends, because they wouldn't come and see me or were too busy for me to go and see them, which made me feel like I then

wasn't achieving my social life outcome. And what I did was I changed the notion of ... of the goal and I thought well why rely on those people that are so far away. What about doing something here in Bath, with people that I don't know, that might be friends. And that then did change the goal, because I actually decided to set up a [leisure activity] club in Bath. [P021]

Planning and rehearsing key actions

As this was the last of the five tactical intelligence activities, many participants did not find time to properly apply this. However, two participants used it to good effect, rehearsing what to say in difficult encounters.

... thinking of the language that I would use that wasn't confrontational or antagonistic. Um ... to basically say some pretty harsh things ultimately ... about, you know ... the workmanship the ... the materials that they use [...] trying to think of the best language and write down sort of words that I thought would make us um ... make them ... be on our ... come on ... not be on our side, but ju ... kind of [...] that's kind of what we [laughs] rehearsed. [P011]

One of my things that I wrote myself in planning my action was, when talking to my boss, be specific, give good examples. And ordinarily I would have gone in and probably waffled, because I was so anxious. But it made me actually remember that I needed to be clear and just have key things to tell her, rather than taking up loads of time. So ... so that that was quite good and helpful. [P021]

Level 3 – Extra help section

Generally participants skimmed this section, which was essentially a form of appendix. Most appeared to find the perceptual biases and remedies checklist interesting. There was no clear pattern for the rest of this section however.

4.4.2.2 Impact of intervention

The quotations cited in the previous section illustrate the positive and negative reactions to the various components of the intervention. Comments on the overall impact of the intervention ranged from extremely positive to creating a kind of mental blockage, as illustrated by the two extremes below:

This has been amazing, because I realised very early on, you know, with the flow of the activities, that I started to feel better about everything generally, because I ... I now had little structures every day, even if it was just three small tasks to do at work, one little small task at home. I just started feeling really proud of myself. And I thought, you know, this is really great, cos every day I've got something to look forward to. Even if it's a problem I look forward to dealing with it, because I feel better equipped. So it ... it just made me feel a lot more confident of my own ability to control things that were going on. And I have to say it's the most interesting thing I've ever done [laughs]. [P021]

I found the sort of the ... the way of doing it was daunting to my method of ... of working. It sort of ... I just couldn't see how I could do it. It really sort of acted as a log jam. [019]

This demonstrates the need for interventions to address individual differences.

4.4.2.3 Context-related moderating factors

Supportive management

Participant success in applying the intervention was enhanced by supportive managers. Participants 010, 012 and 021 reported extremely supportive line managers. For example:

I took that list to my line manager and I said, 'These are all the things that I get asked to do by staff and I don't know how to deal with it, because I'm sure I shouldn't be doing them and I don't have time to do them.' And it was really helpful, because [...] when she saw the list, she was very positive and she said, 'Absolutely, you know you can't be wasting time doing these tasks ... um ... you know, we perhaps need to look into this and I'll talk to your [more senior manager] and we can get something organised.' So actually what I thought was a massive problem, got resolved quite quickly, in fact within an hour [laughs] because my line manager totally agreed. [P021]

Personal autonomy

Having a considerable degree of work autonomy provided more opportunities to exploit the potential of the intervention. For example:

If I was in a very much more restricted and rigid role, I ... I probably wouldn't have had as much freedom to make the decisions I made and to change the things that I could. But I am left to be very self-sufficient in my job, and ... basically as long as I prioritise my tasks according to importance of my academic calendar, which is what I work towards, then I can do the work as and when. As long as it's done by those deadlines, it doesn't matter what priority I do it in. [P021]

The level of personal autonomy could differ from domain to domain however. For example:

I think if I was on my own, I could do things like that. I think with my husband around, he would, 'Ooh, ooh, ooh,' you know, [laughs] 'Come on, let's ...' [laughs] and I think it would be difficult [...] We tend to do things together all the time and go places together and ... even watching telly, he would expect me to be next to him, rather than [laughs] upstairs, you know what I mean? It's ... just the habits we've got into I suppose over a [laughs] lifetime. [P012]

Environmental change

Recent change in a particular life domain appeared to offer more opportunities to apply the intervention. Participant 021, for example, had had a complete change of context and applied the writing activities to work, personal and social issues.

Landing here at Bath in this job has been an incredible change. I've never worked at a university before. And I think it's brought about such massive change and change that I'm still going through, because I still don't know a lot of things about working in a university. I feel like I'm still in a transition period and I haven't quite finished. So this just hit me at the right time, because I'd not set roots for myself in my behaviours, in my habits, in my thinking patterns. I'm still in free-fall as it were. And I haven't quite hit the ground yet. But I think once I do hit the ground, it's gonna make it harder for me to ... to take on this kind of thing again, because I'll have acquired things in my life, you know, responsibilities, people, um ... more tasks in my job or more demands in my job. [P021]

In contrast, participant 012 had experienced changes in just the work domain and this was where she applied the intervention activities, i.e., not to her home life, which was unchanged.

I've been put into this job. It's not something I've got any experience in at all. You know, I was an experienced [type of administrator in a different university department] and I've ended up doing [different type of role in different department], which, you know ... it started in September last year, so I haven't even gone through a full year of it. So I really don't know anything, you know [laughs]. [P012]

4.4.2.4 Feedback for possible design improvements

The feedback in section 4.4.2.1 highlighted various avenues for improving the content of the writing activities. This section addresses two other aspects of the writing process.

Writing time

The instructions (Appendix C6) had suggested participants perform the writing activities shortly before going to bed. This stemmed from the possible influence of pre-sleep mood states on cortisol awakening response, highlighted by Wilhelm et al. (2007), cited in section 3.3.3. However, the feedback indicated that many participants were reluctant to write at home, particularly as most were writing about work issues.

I'd rather try to fit it into work. [P020]

A lot of people by the time they've finished work and they go home, they don't wanna be doing work-related things and ... I think I did struggle a little bit at first, making myself sit down and do this, because I felt like it was work, so it was hard to ... to get myself from my leisure time to then focus into a work frame of mind. [P021]

The ideal time for this participant was at the end of the working day.

That last hour of my working day, which is usually 4 till 5, um ... that is my down time, because I ... I reflect on what's happened during the day. And I then start thinking about what I need to do tomorrow. [P021]

For another it was usually just after getting home from work.

It sounds a bit bizarre, but I actually think it works quite well for me to come home and sit down with a hot drink, and do it, get it out of the way [...] It doesn't always work out, because if I'd had a particularly bad day, sometimes I ... I need a bit more time, but actually I think that um ... in a way kind of ... it finishes the day off for me, the work day off for me. [P011]

One advantage of home was the absence of interruptions.

Doing it away from the work situation was useful, although I must admit I did begrudge that in a way, because I shouldn't be spending my evenings planning my next day's work [laughs] things, but it did help a lot, because my mind was less cluttered and there was no ... nobody around, people coming in and interrupting me. [P012]

Writing mode

A limitation with the present study was that participants' writing was not seen. In preparation for a planned change to the next study, participants were asked their opinions regarding performing such activities online. Just one of the eight participants was strongly against the idea. She commented:

You'll censor it, you'll, you'll, your internal censor will immediately be switched on ... somebody else is going to read this and you'll either want to be an actor and show off or you'll just not ... not be truthful. [P010]

She also felt the physical act of writing was important.

I believe that if you are going to actually have any kind of engagement with yourself as a person through writing, it has to be done through handwriting on paper. [P010]

The other participants, however, were generally open to the idea provided key safeguards were met. One was anonymity:

I personally wouldn't mind that. And I think personally that's a very good idea. Cos one thing I did wonder about this was, you know um ... how can you ... how can you tell that people have really, really done it? Um ... and it would be a shame if ... if people hadn't done it really. Cos I think there's a lot to be said for it. So I think that would be a great idea. And perhaps um ... just, you know, anonymising it by the use of the numbers,

which you did anyway for the consent forms, you know, might make people feel sort of more at ease. [P021]

Another issue was security:

Don't think it would have been a problem for me particularly, no ahh, I think you have to ... you have to ahh ... you do have to deal with the question of security of data. Ahh because how do I know only the researcher sees it. Because it ... I say it is quite personal data. And I don't know how on earth you ... ah ... how on earth you um ... you guarantee that. But if I'm very ... if I'm very honest [...] it's a generational issue, isn't it? You know, I'm sure my daughters wouldn't give a monkeys, because they already write god knows what onto Facebook. [018]

Thus, it appeared that online capture should be feasible, provided confidentiality and security issues were addressed.

4.5 Discussion

This section begins with a summary of the key findings, set out under headings corresponding to the first four aims outlined in section 4.1.2. This is followed by discussion of the implications of the findings for these aims, as well as for the broader research and development process. The section concludes with a discussion of the limitations of the study.

4.5.1 Summary of key findings

4.5.1.1 Understanding and application of concepts and activities

The qualitative feedback suggested that the manual was too long. For some it was too complex, but all participants reported understanding the nature and significance of the basic stress model and three core intelligence constructs. There were difficulties, however, in applying some concepts and activities. These are summarised below.

Regarding the conceptualisation of stress, participants had no difficulty applying the 'demands versus resources' model to task-related issues. Some struggled, however, when applying it to people-related issues.

For perceptual intelligence (PI), the issue was raised of people's ability to challenge their own perceptions without active third party involvement. Despite this, there were several examples of successful independent application of PI, particularly for issues involving complexity, uncertainty and other people's motives and perceptions.

For strategic intelligence (SI), there was little evidence of participants thinking strategically or deeply about goals prior to the intervention. This appeared to hinder successful application of the goal hierarchy task. In general, little attention appeared to

have been paid to different goal types. Although there was some mention of thinking about goal balance (i.e., in terms of domains), there was no evidence of participants making significant efforts to change any perceived imbalance. Activities were generally directed towards everyday task-related problems in the work domain.

For tactical intelligence (TI), the most easily understood and widely used activity was 'listing and organising tomorrow's actions'. The 'current signals' activity, especially the red, proved useful. 'Problem rebalancing' worked well, particularly in terms of challenging internal demands. The 'finding alternative routes' activity was less successful. This appeared to be related to difficulties generating realistic hierarchies of primary and secondary goals. 'Planning and rehearsing key actions' was found useful by some, but generally not widely used. A key difficulty highlighted in implementing plans was resisting competing impulsive drives.

Two participants appeared to struggle with the highly structured sequential approach, highlighting the possible influence of different learning or information processing styles.

4.5.1.2 *Effects of intervention*

The quantitative results indicated that six out of ten participants engaged with the intervention, five moderately and one thoroughly. The qualitative interviews provided many reports of participants finding the various activities useful. The main source of benefits appeared to be through more explicit focus on work goals and better organisation of activities.

However, for the mainstream category 3 participants, this was not matched by corresponding improvements on the self-report measures of psychological well-being. Outcomes were mostly positive for work-related goal progress, but negative for self-esteem, self-efficacy and perceived stress. Results were more encouraging, however, for the fully engaged category 4 participant, who showed improvements across a range of measures, suggesting a possible dose response in terms of effort and reward.

4.5.1.3 *Factors influencing participant response to the intervention*

The quantitative data suggested the following factors may play a role in determining participant engagement: age, gender, emotional stability, extraversion, openness to experience, need for cognition, self-esteem, self-efficacy, tangible social support, and goal progress. The qualitative data highlighted the possible influence of broader contextual issues. These included management support, job-role autonomy and recent environmental change. The qualitative feedback also highlighted a person-related factor not addressed in the online questionnaires, namely preferred information processing style. It also highlighted issues that may inhibit intervention effectiveness, such as poor impulse control and lack of goal salience.

4.5.1.4 *Feedback regarding possible design improvements*

The feedback outlined in section 4.4.2.1 and summarised in section 4.5.1.1, regarding participant reactions to the concepts and activities, highlighted a number of avenues for possible design improvements, such as enhancing participants' ability to challenge their own perceptions or resist competing impulsive drives. The feedback outlined in section 4.4.2.4 also provided insights into possible improvements in terms of the timing and mode of writing. For the former, there was a general consensus that writing sessions should be shorter. Also, where the focus was on alleviating work stress, participants thought activities should be conducted while still in 'work mode'. For 'writing mode', most participants had no major objection to performing writing activities online, provided issues of anonymity and security were adequately addressed.

4.5.2 Implications

4.5.2.1 *Understanding and application of concepts and activities*

It was evident from the feedback that the manual needed to be shortened and various concepts and tasks simplified. To approach this in a systematic way that would hopefully enhance the intervention's effectiveness, the following three principles were adopted to guide the revision process. They were derived from the I/E/T dimensions applied in Chapter 3.

1. Internal factors

Reducing internal resistance to successful use of techniques by removing or simplifying concepts that participants struggled to comprehend or apply (e.g., the application of the demands/resources imbalance to people-related stress). As the interventions were intended to be self-administered, concepts needed to be readily comprehensible.

2. External factors

Reducing external resistance to successful use of techniques by steering participants towards activities over which they were likely to have more influence or control (e.g., addressing issues of intrapersonal organisation before tackling difficult interpersonal disputes).

3. Time factors

Encouraging focus on goals that could be achieved or advanced within the timescales of the intervention (e.g., within days or weeks rather than months).

The principal changes made are outlined in Chapter 5.

4.5.2.2 Effects of intervention

The positive results for participant 021 demonstrated that the goal-momentum intervention appeared capable of generating improvements across a range of self-report measures of psychological well-being. The deterioration on some key measures for category 3 participants mirrored, for example, the impact on self-efficacy of the Lestideau & Lavalée (2007) study, first cited in Chapter 2. The latter may have been too simplistic, whereas the current study appeared to have been too complicated. The challenge is to find the right balance.

An encouraging result for the category 3 participants was the progress on work-related goals for four out of five of the group. This suggested that the self-administered training was capable of positively impacting self-regulatory performance in the workplace. Interestingly, the one participant (012) who recorded a negative change on work progress, also recorded the greatest negative change on total goal progress, despite voicing enthusiasm for the intervention in the qualitative feedback. She also registered the largest T1-T2 increase in perceived stress. It is possible that this may have been related to extraneous factors beyond the intervention, but this did not emerge from the interview. The participant did, however, comment in the interview that she had never really thought deeply about her problems before and this may offer an explanation as to why her ratings of stress and adverse goal states were higher at T2.

My tendency is not to think about things. And just to do and get on with it. But this has really made me think about things. And that's hard to do. I find it very [laughs] stressful. Um ... but I think it's probably what I should do. I can see now that just carrying on blindly is not a good idea. And I really ought to be putting more thought into things and practising thinking about things. So ... so perhaps in that respect ... emotionally it would be better for me if I do think. [P012]

Interestingly, the same participant showed the greatest reduction on the habitual index of negative thinking (HINT). A possible interpretation could be that explicitly addressing problems may have reduced the unconscious triggering of thoughts or worries about such issues. According to Brosschot et al.'s (2006) perseverative cognition hypothesis, such a change might be expected to reduce cortisol levels. This is further explored in Study 3.

4.5.2.3 Key factors influencing outcomes

A key aim of the study was to identify person and contextual factors that might indicate where this type of intervention might be most or least appropriate. Table 4.9 on the next page lists possible moderators emerging from the quantitative and qualitative data. These are grouped according to the process levels set out in Chapter 3. Stress

reduction and enhanced stress reduction are combined in the table, as they relate to the same fundamental process.

Table 4.9 Study 1: Process levels and key variables possibly influencing intervention outcomes

Process level	I/E	Possible key variables
Stress reduction (plus enhanced)	Internal	<ul style="list-style-type: none"> • Information processing style (010) • Control of non-rational impulses (011, 016) • Goal salience (011, 016, 019) • Emotional stability (021) • Extraversion (021) • Openness to experience (021) • Outcome expectations, e.g., where improvements feasible, e.g., work versus family issues (011, 012)
	External	<ul style="list-style-type: none"> • Ease of concept application (011, 020) • Management support (010, 012, 021) • Job-role autonomy (012, 021) • Recent environmental change (012, 021) • Tangible social support (021)
Motivation/ learning/ reinforcement	Internal	<ul style="list-style-type: none"> • Age, gender (018, 019) • Emotional stability (014, 015) • Self-efficacy / self-esteem / goal progress (014, 015) • Information processing style (010, 019)
	External	<ul style="list-style-type: none"> • Recent environmental change (021) • Tangible social support (021)
Communication/ presentation	Internal	<ul style="list-style-type: none"> • Need for cognition (014, 018, 021) • Self-efficacy (021)
	External	<ul style="list-style-type: none"> • Volume (most participants) • Concept complexity/clarity (012)

The variables noted were allocated to the process levels most closely associated with the relevant source data (participant number shown in brackets). However, as highlighted in section 3.5 of the previous chapter, the health behaviour addressed by the intervention was multi-layered and hence constructs such as self-efficacy, outcome expectations and various facilitators/impediments could be applied to each level of activity, e.g., reading/absorbing the manual, engaging in and persisting with the writing activities, and ultimately applying the techniques in pursuit of goals.

As this was an exploratory study based on a small sample size, the moderators listed in Table 4.9 were suggestions highlighted for further investigation, rather than a conclusive list. Two types of follow-up action were envisaged. Firstly, where the potential moderating factors could be altered (e.g., reducing the volume of instructions or offering guidance on the control of non-rational impulses), the intervention was

modified to try to reduce possible barriers to effectiveness (see Chapter 5). Secondly, where appropriate measures were available (e.g., information processing style), these were added to Study 2 (see Chapter 6) to try to assess the impact of the presumed moderators on the key outcomes.

As the list of factors was not exhaustive, key moderators may have been missed. Pre-existing coping style, for example, might have been expected to influence outcomes. However, no clear trends were evident from the coping style scores. Interestingly, the case of participant 012 highlighted a limitation of COPE measures and a benefit of method triangulation. From the interview, it appeared that this participant had an avoidant coping style and yet she scored highly, for example, on active coping. Research exploring mismatches between coping style and information provision (e.g., Miller & Mangan, 1983) would suggest that an active coping intervention of this type might be inappropriate for someone with an avoidant coping style. The participant's higher perceived stress post-intervention would certainly be consistent with this. However, the interview with the participant further revealed that despite being stressful, she felt the intervention was something she should put more thought into and that it would be better for her emotionally, which could possibly tie in with her reduced T2 HINT score. This illustrates that there are different levels and subtle distinctions within coping approaches and the experience of stress that are not easily captured by conventional coping style inventories. Use of a mixed methods approach, therefore, helped provide a more comprehensive picture of the possible processes involved.

4.5.2.4 *Design improvements*

There were two main aspects to improving the design. Firstly, improving the content and presentation of the intervention and secondly, improving the testing and assessment of intervention effects. These are addressed in detail in Chapters 5 and 6, respectively.

4.5.2.5 *Implications for broader research and development process*

The study described in this chapter principally corresponds to the 'feasibility and piloting' stage of the Medical Research Council's guidelines on 'developing and evaluating complex interventions' (MRC, 2000; Craig et al., 2008). There are three key components to this stage: testing procedures; estimating recruitment and retention; and determining sample size. The study also included an element of 'evaluation', for which the MRC guidelines highlight a further three components: assessing effectiveness; understanding change process; and assessing cost effectiveness. Conclusions for each of these six components, following Study 1, are summarised in Table 4.10 on the next page. However, as stated previously, whereas the MRC guidelines are framed in terms of a one-off process for an end intervention, the interventions in this thesis were

designed as a means to an end, i.e., part of an ongoing process of exploration and refinement of self-regulatory coping mechanisms. The answers in Table 4.10 are therefore more provisional / less definitive than would be expected when testing an end intervention, as they simply address the transition from Study 1 to Study 2, i.e., from one type of pilot to the next.

Table 4.10 Research process status following Study 1

Process element	Position following Study 1
1. Testing procedures	Concepts and activities require further refinement.
2. Estimating recruitment and retention	Intervention seemingly too complex for optimal recruitment and retention. Simplification therefore required.
3. Determining sample size	Studies 1 and 2 very different in nature. Study 2 requiring power for inferential statistics – addressed in Chapter 6.
4. Assessing effectiveness	Intervention not yet adequately effective, as only one participant clearly benefited.
5. Understanding change process	Component processes provisionally understood from prior self-regulatory theory and empirical evidence. How processes best integrated, learnt and applied, not yet understood.
6. Assessing cost effectiveness	Not assessed for manual-based intervention, as not intended final format.

Craig et al. (2008) also highlighted pragmatic trade-offs that often need to be made in developing and evaluating interventions. Section 5.6 of Chapter 5 outlines research process trade-offs made in the design of the intervention for Study 2.

4.5.3 Limitations

There were numerous limitations to this study. Qualitative issues are summarised first, then quantitative and finally issues regarding the combination of the two types of data. For qualitative, the method of analysis chosen, framework analysis, strongly influenced the nature of the information derived from participants. Alternative methods, such as grounded theory (Glaser & Strauss, 1967) or interpretative phenomenological analysis (IPA; Smith, 1996), are in principle more open and exploratory in their approach. Framework analysis focuses the spotlight on specific areas predefined by the researcher. This carries the risk of possibly missing valuable insights that might have been gained from a less structured interview process. Thus, this particular study explored participants' reactions to the concepts and techniques presented by the researcher. It did not explore in any depth alternative coping techniques used by participants, such as exercise or forms of relaxation. Not only were there possibly

unexplored issues within this group, but also further unexplored issues in the broader population of interest, as this was a small purposive, non-representative sample. Furthermore, with only one researcher and, for example, no inter-rater reliability checking on the coding, the results presented constituted just one person's interpretation of the data. A team of researchers with diverse backgrounds might have highlighted a broader range of issues. However, with so many possible avenues and limited time and resources, the guiding research principle had been to focus on reactions to the specific concepts and coping techniques presented in the training manual.

The main quantitative limitation stemmed from the small sample size, with only six participants completing the intervention. Thus, there was not enough power for any inferential statistical analyses. However, as already stated, this was not an aim of the study. A key quantitative aim was to test and select measures for inclusion in later studies. The mixed methods approach proved useful in this, with the interview data, for example, highlighting:

- limitations of certain measures (e.g., COPE);
- need for new measures (e.g., addressing information processing style);
- participant concerns about questionnaire length;
- possible sources of error (e.g., participants reporting ticking mid-scale values when tired or not understanding a scale item).

Finally, there were limitations regarding how the qualitative and quantitative data were combined. There are clearly advantages to be gained from triangulation, as highlighted above. However, in this study the triangulation principally occurred at the analysis stage after all the data had been collected, which is the norm for concurrent designs. However, with more time, use of a sequential explanatory design (i.e., quantitative followed by qualitative: Creswell, 2009) in the post-intervention stage, might have been more illuminating. Though qualitative (i.e., interviews) did follow quantitative (i.e., online questionnaire), there had not been sufficient time to process the questionnaire results before the interviews as, despite reminders, some participants only completed the follow-up questionnaire on the day of the interview. There were, however, some elements of a sequential explanatory approach in that the quantitative data from stages 1 and 2 (i.e., online questionnaire 1 and activity record form) had been processed and were therefore discussed in the final interview. However, the discussions would have been more comprehensive, if the results of the intervention (i.e., questionnaire 1 to 2 changes) had been available.

4.6 Conclusion

Despite the limitations above, the study generated a large amount of feedback to help refine the intervention, the theoretical modelling and the measures applied. Different participant samples and different researchers might well have highlighted different issues. Wider replication of this kind of research would therefore enrich the knowledge base. At the very least, however, this study demonstrated that this type of mixed methods research offers a feasible means of piloting and evaluating a complex self-regulatory coping intervention. The next chapter describes the key changes made in seeking to enhance the intervention, based on the feedback from Study 1.

CHAPTER 5: FURTHER DEVELOPMENT OF CONCEPTUAL FRAMEWORK AND INTERVENTION

5.1 Introduction

This chapter outlines the key changes made to the goal-momentum intervention and underlying concepts, based on the findings of Study 1. It summarises the changes at each of the process levels on which the intervention was based (as set out in Chapter 3). As noted in section 4.5.2.1, the main objectives driving the changes were to (a) reduce internal resistance to the learning and application of the self-regulatory skills, (b) reduce external resistance to the successful application of the skills, and (c) reduce timescales over which improvements might be achieved.

The revised intervention is provided in Appendices D5, D6 and D7.

5.2 Stress-reduction process

Two changes were made at this process level: (i) the goal-momentum model was revised; and (ii) the application of the stress model was simplified.

5.2.1 Goal-momentum model

To be of maximal value, models need to address all key issues relevant to a particular purpose. Any blind spots (i.e., key omissions) risk undermining their utility. Study 1 highlighted such a blind spot within the goal-momentum model. Feedback from participants 011 and 016, cited in section 4.4.2.1, illustrated how rational goal pursuits can be blocked by competing impulsive drives. Such interference is not addressed by control theory, upon which the goal-momentum model was based. The phenomenon can, however, be explained by dual-process models of human cognition, which contrast two types of information processes regulating behaviour. There are numerous dual-process models with slightly different labels for the two processes (e.g., experiential versus rational processes, Epstein 1994; impulsive versus reflective processes, Strack & Deutsch, 2004), but the distinction is essentially the same. Table 5.1 on the next page, adapted from Evans (2008) and Epstein, Pacini, Denes-Raj, & Heier (1996), lists key attributes associated with the two types of processes.

A review of such models by Evans (2008) suggested that the assumption of two separate systems is an oversimplification. Type 1, for example, is not a single system. It encompasses a variety of automatic processes, such as perception, attention, language processing, associative learning (i.e., forming implicit memory) and automated behaviours (habits). This has led some researchers to propose alternative multiple process models (e.g., Sherman, 2006). Others, in contrast, have proposed an

integrated single process model (e.g., Kruglanski, Erb, Pierro, Mannetti, & Chun, 2006). The latter is based on the assertion that some of the dimensions of comparison listed in Table 5.1 might be better characterized as continua rather than strict dichotomies.

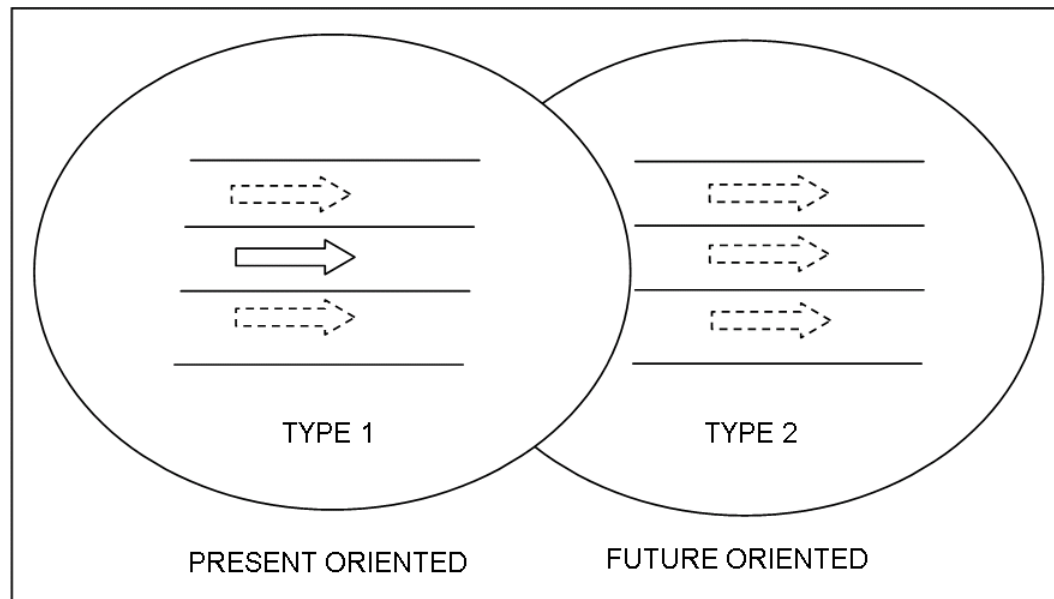
Table 5.1 Key attributes associated with two types of cognitive processes

Type 1 – Experiential/Impulsive	Type 2 – Rational/Reflective
Unconscious/preconscious (implicit)	Conscious (explicit)
Automatic, low effort	Controlled, high effort
Rapid parallel processing: oriented towards immediate action	Slow sequential processing: oriented towards delayed action
Independent of working memory	Dependent on working memory
Affective: pleasure-pain oriented (what feels good)	Logical: reason oriented (what seems sensible)
Behaviour mediated by gut feeling / intuition about events	Behaviour mediated by conscious appraisal of events
Slower and more resistant to change: changes with repetitive or intense experience	Changes more rapidly and easily: changes with strength of argument and new evidence
Encodes reality in concrete images, metaphors and narratives	Encodes reality in abstract symbols, words and numbers
More crudely differentiated: broad generalization, stereotypical thinking	More highly differentiated

Despite ongoing debates about how best to characterize such processes (e.g., Evans & Stanovich, 2013), the dual-process dichotomy is a useful metaphor that improves on the explanatory power of basic control theory. It was therefore incorporated into the revised goal-momentum model shown in Figure 5.1 on the next page and informed many of the changes made to the intervention for Study 2. (N.B. The previous version of the goal-momentum model is shown in Figure 3.7.)

The two sets of three arrows in the model are simply illustrative of the multiplicity of goals. The arrow with the continuous line shows the type 1 goal (impulsive drive) that is currently being pursued. In the case of participant 016, cited in Chapter 4, this could, for example, be watching a TV programme from his Sky box.

Figure 5.1 Dual-process goal-momentum model



This model highlights a key challenge for self-regulation, namely balancing competing present-moment drives and future-oriented goals. This is closely related to Fujita's (2011) dual-motive conceptualisation of self-control (a component of self-regulation) as the process of advancing abstract distal goals over competing concrete proximal goals. From an evolutionary perspective, Nesse (2005) suggests this challenge has never been greater, as the sophistication of modern societies has increased the complexity and timescales of type 2 distal goal pursuits far beyond anything our distant ancestors would have encountered. At the same time, opportunities for type 1 instant gratification have never been more abundant.

This dual-process goal-momentum model, therefore, underpinned the development of the revised intervention for Study 2. It was not, however, presented directly to participants, as (a) it had not been piloted in Study 1, and (b) it might have been confusing to participants expecting an emphasis on stress reduction rather than self-regulation. The only model presented, therefore, was the stress 'imbalance' model, which had featured in Study 1. Though the model was the same, the way it was applied was simplified, as explained in the next section.

5.2.2 Stress model

The training manual for Study 1 distinguished two types of stress, task-related and people-related. Some participants, however, had difficulty relating the 'imbalance of demands versus resources' model to the latter. The imbalance model used was based on Lazarus & Folkman's (1984) cognitive theory of stress and coping, cited in Chapter 2. There are other ways of conceptualising stress appraisal that may be more appropriate for people-related stress, such as expectancy violations (Mendes,

Blascovich, Hunter, Lickel, & Jost, 2007) or script inconsistencies (Bartlett, 1998), both of which relate to the comparator function of the control theory feedback loop (Carver & Scheier, 1981, 1982). However, as participants tended to focus mainly on task-related goals and the imbalance model worked well for this, it was decided to retain the existing model and drop the distinction between task-related and people-related stress. This could of course be revisited in follow-up studies.

5.3 Enhancing stress-reduction process

This section outlines key issues and changes to the SI, PI and TI components of the intervention, stemming from the feedback from participants in Study 1. The order of presentation of the components was changed for the intervention for Study 2. The SI component was addressed first, as it was presented as a one-off initial preparatory activity in the revised intervention.

5.3.1 Strategic intelligence

Two key issues addressed were goal salience/authenticity and goal content/framing.

5.3.1.1 Goal salience and authenticity

The feedback from Study 1 suggested that several participants saw themselves as having no goals, which would be problematic for self-regulatory theory if true. However, such findings could be explained in terms of the dual-process goal-momentum model (Figure 5.1) as evidence of some participants being driven more by implicit type 1 processes than explicit type 2.

In discussing goal representations (also termed 'construals'), Karoly (1993) highlighted three components needed to prompt action in pursuit of goals. They were value preferences, commitments and anticipatory cognitions such as self-efficacy. A possible interpretation of the feedback from participants is that SI activities designed to elicit type 2 goals may have elicited value preferences, but not necessarily goals that participants were committed to or perceived themselves as capable of achieving. This could, for example, explain the perceived artificiality of tasks or lack of goal authenticity referred to by participant 016. The artificiality may have stemmed in part from instructing participants to describe their 'ideal self/situation'. Though based on Scheier & Carver's (2003) goal hierarchy, the word 'ideal' may have evoked something too remote, abstract, or unrealistic for some, particularly for those oriented more towards type 1 goals.

Any sense of artificiality would have undermined the potential of the subsequent PI and TI activities. As highlighted by Sheeran et al. (2005), for example, the impact of implementation intentions is moderated by the activation and strength of superordinate

goal intentions. However, there may be better, more grounded ways of eliciting participants' superordinate goal structures. Emmons (1986), for example, instructed participants to generate lists of objectives that they were typically trying to achieve and termed these 'personal strivings'. They were also asked to recall instances of their having acted in line with these strivings, which would have helped guard against artificiality. Participants were then asked to rate each striving along various dimensions (e.g., ambivalence, commitment, importance, effort and difficulty).

Employing such a method for Study 2 would have helped identify the goals to which participants were most and least committed. However, adding a goal-rating activity would have increased participant burden and the abstract nature of the exercise might have been particularly counterproductive for more type 1 oriented participants.

The issue of the perceived artificiality of tasks was therefore addressed in the following two ways:

1. By virtue of their having volunteered for 'stress-reduction' training, participants were assumed to have demonstrated a degree of commitment to reducing stress. It thus appeared reasonable to treat this as a common superordinate goal or 'personal striving' around which to design the SI element of the training. The SI activity, therefore, specifically focused attention on identifying ways of reducing stress. The approach adopted involved applying the TI 'problem rebalancing' activity at a strategic level, i.e., noting general ways of reducing internal and external demands and increasing internal and external resources. No mention was made of goal hierarchies or primary or secondary goals.

To guard against artificiality, participants were asked to focus their attention on just one or two actions that they could definitely see themselves performing. These actions were then carried forward into the tactical intelligence section for subsequent implementation. If participants could not think of definite actions, they were instructed to write 'n/a' to avoid creating false or meaningless targets for action.

2. If participants could not identify any higher order strategic goals, the default option was simply to use the TI activities to concentrate on more concrete, day-to-day tasks and objectives.

The SI activity was therefore presented as a one-off session at the start of the intervention. It served as a form of orienting device. There was no perceived value in repeating the activity, as even if participants had noted explicit type 2 long-term goals, it was thought unlikely that they would change significantly over the course of a short

intervention. This was reinforced by evidence from Miller & Wrosch (2007), for example, indicating that people often have difficulty disengaging from goals even when unattainable.

5.3.1.2 Goal content and framing

In terms of goal content, the intervention in Study 1 had sought to emphasize goals based on the core components of self-determination theory (SDT; Deci & Ryan, 2000), i.e., autonomy, competence and relatedness. The intention had been for participants to apply the stress-reduction activities to their lives in general. However, it appeared that most participants had focused on work issues. This may have been partly due to some considering work issues easier to address and partly due to recruitment having been via the workplace. Applying the principle of ‘stimulus response compatibility’, one of many ‘nudges’ highlighted by Thaler & Sunstein (2008), the revised intervention, therefore, focused on workplace issues as this matched participants’ expectations. In line with this, an SDT-based work needs scale measure (see Chapter 6) was also included in the pre- and post-intervention questionnaires.

In terms of framing, the intervention had sought to encourage pursuit of more adaptive goal types, e.g., intrinsically motivated rather than extrinsically, process rather than outcome, unlimited resource rather than limited, and approach-based rather than avoidance-based. There was, however, no evidence of participants having changed the nature of the goals they pursued. Arguably, the impact of goal framing had not really been tested, as the goal types had not been given much prominence within the level 2 core programme notes. The full details had been in the level 3 ‘extra help’ section, which few participants paid much attention to.

To address this in Study 2, just a single goal type distinction (internal/process versus external/outcome) was selected and given more prominence. The reason for the choice was that it was supported by evidence (e.g., Taylor et al., 1998) and fostered a greater sense of autonomy by encouraging participants to focus more on what they could control (i.e., current processes rather than future outcomes). It was also considered more straightforward than, for example, trying to reframe approach versus avoidance goals.

This distinction between process and outcome goals was also used to try to make ‘self-image’ goals more immediate and concrete (see also section 5.5.2 regarding ‘concreteness’), by translating distant outcome goals of ‘being’ a certain way (e.g., calm, confident) into immediate process goals of ‘acting’ a certain way.

There are, of course, many more insights into goal content and framing that could have been included in the SI section of any revised intervention, such as goal-setting theory

(Locke & Latham, 2002) and the dynamics of goal pursuit (e.g., Bonezzi, Brendl, & De Angelis, 2011). However, as the feedback from Study 1 had highlighted possible diminishing marginal returns from excessive information provision, no further insights were added.

5.3.2 Perceptual intelligence

Two key issues addressed were the development of critical self-awareness and the application of PI processes.

5.3.2.1 *Developing critical self-awareness*

The perceptual intelligence (PI) construct appeared to be more readily understood than applied. Encouraging people to challenge their perceptions involves inviting them to accept the possibility of being wrong and to search for alternative, more balanced and accurate interpretations of events or situations. As highlighted by participant 010, without input from others, many people may not even realise the possibility of their being wrong. This is illustrated, for example, by participant 016's comments about some problems being 'so glaringly obvious that there is not much wriggle room'.

The solution adopted for the revised intervention was to use the dual-process distinction between an impulsive and a rational self to encourage intrapersonal perspective taking. To reinforce this, a 'child' versus 'adult' analogy was used, as well as references (somewhat oversimplified) to evolutionary theory and neuroanatomy.

A concern with the 'impulsive self' metaphor, however, was that it would only draw attention to certain types of behaviour, e.g., instant emotional responses. This would have left another key aspect of type 1 behaviour unchallenged, i.e., learned habitual behaviours, which make up much of our daily lives (Ouellette & Wood, 1998). To address this, a third self-concept was added, i.e., the 'habitual self', for which an automated robot metaphor was used (see Appendix D5 – Training guidance notes: section 3). The issue of habitual behaviours is also further addressed in section 5.4.3.

5.3.2.2 *Applying PI Processes*

In the training manual for Study 1, the PI activities had been split into two components, i.e., 'Activity A – Challenging your perceptions' and 'Activity 1 – Current signals – Red, Green or Amber' presented as the first of the TI activities. 'Activity A' essentially addressed the PI mental approach and 'activity 1' the practical application of that approach. However, splitting them across two intelligence categories, i.e., PI and TI, had created a possible source of confusion. In the revised intervention, therefore, the 'activity A' attitudinal element was absorbed into the 'current signals' instructions and

the combined activity was relocated to the PI section (see Appendix D5 – Training guidance notes).

Though most participants had focused on the red/negative emotions element of Activity 1, the other two elements, i.e., positive and neutral, were retained to provide an appropriate response option whatever a participant's mood. The colour coding was dropped, however, as one participant had found this confusing.

Participant 016 appeared to have confused PI with 'positive thinking'. Given that the two are different and that the value of positive thinking has been challenged (e.g., Ehrenreich, 2009), the revised training guidance notes emphasized that PI was about balanced and flexible thinking, rather than positive thinking.

5.3.3 Tactical intelligence

There had been five TI activities in the training manual for Study 1 (Appendix C7). Relocating the first 'current signals' activity to the PI section, as described above, reduced this to four. Removing the fifth activity, 'planning and rehearsing key actions', (as it had been rarely used) further reduced the number to three.

Three new TI activities were then added. One of the activities (Appendix D7, section 3, question 12: 'What little extra can you add today for one of your own longer term strategic goals?') was added to incorporate an element of SI implementation into daily planning. The other two new TI activities addressed different aspects of the dual-process distinction. They are explained in the next two sections.

5.3.3.1 *Resisting unhelpful type 1 processes*

As mentioned in section 5.2.1, feedback from participants 011 and 016 had illustrated how rational goal pursuits can be undermined by competing impulsive drives. A new activity (Appendix D7, section 3, question 9: 'When is the best time to do them?') was therefore added to help boost participants' resistance to unwanted interference from type 1 drives. It involved encouraging participants to use implementation intentions (Gollwitzer, 1993; Sheeran et al., 2005) to schedule their daily tasks in such a way as to minimize the incidence and impact of ego depletion (Baumeister, Bratlavsky, Muraven, & Tice, 1998; Muraven & Baumeister, 2000). The measures to minimize ego depletion included:

1. Scheduling unpleasant/difficult tasks (in pursuit of type 2 goals) early in the day when self-control resources were likely to be high (Boland, Connell, & Vallen, 2013).
2. Scheduling positive emotional experiences (type 1 activities) across the day as short rewarding breaks. This was prompted by research suggesting that positive

affect can counteract ego depletion (e.g., Tice, Baumeister, Shmueli, & Muraven, 2007).

3. Scheduling a positive treat for the end of the day. This was intended to avoid and possibly reverse a phenomenon, demonstrated by Muraven, Shmueli, & Burkley (2006), that when people anticipate having to exert self-control in the future (e.g., a difficult task later in the day), they tend to perform relatively poorly on intervening tasks as a result of trying to conserve self-control strength.
4. Trying to factor intrinsically motivated type 2 activities (termed 'pleasant investments') into the day. This stemmed from research by Moller, Deci, & Ryan (2006) suggesting that ego depletion applied to external regulation, but not to autonomously-controlled intrinsically motivated activities. Subsequent research (e.g., Graham, Bray, & Martin Ginis, 2014) has suggested that autonomous, intrinsically motivated regulation simply delays rather than eliminates ego depletion. However, even a short-term delay could still prove useful, for example, if it contributed to the accomplishment of more tasks.

The various instructions were grouped under the heading of 'optimising motivational efficiency', i.e., minimising the need for self-control effort. Consideration was also given to making further use of implementation intentions, as Gollwitzer, Sheeran, Trotschel, & Webb (2011), for example, had highlighted how they could be used to counteract situational priming of competing goals, as well as interference from external distractions. However, given the need for simplification in the revised intervention, these additional possibilities were not included.

5.3.3.2 Using helpful type 1 processes

The previous section outlined an activity added to combat problematic aspects of type 1 processes. This section describes an activity added to utilise some of the advantages of type 1 processes. The activity, shown in Appendix D7 (section 3, question 13), was entitled, 'How can you shape your physical and social environment to help you?' It stemmed from the idea of type 1 behaviours being automatically triggered by one's environment. The activity, therefore, suggested that individuals shape their environments to trigger more desirable behaviours. It was based on Bandura's (1978) concept of reciprocal determinism, as well as Thaler & Sunstein's (2008) nudge principles. However, as the nudging was self-initiated, it avoided the potential pitfalls of libertarian paternalism highlighted, for example, by Sugden (2009).

As implied by the title of the activity, the nudging applied to one's social as well as physical environment. This was to encourage participants to think more carefully about their interaction with and impact on others. Consideration was also given to including

social skills guidance, such as active/constructive responding (Gable, Reis, Impett, & Asher, 2004) that had featured in the training manual for Study 1 (level 3, final page). However, given the emphasis on reducing the volume and complexity of the intervention, no specific social skills guidance was included.

5.4 Motivation/learning/reinforcement process

Bandura's (1986, 2001) social cognitive theory and other similar social cognition models (see section 3.5) are principally designed to address conscious determinants of behaviour. As the revised intervention described in this chapter aimed to tackle both conscious (type 2) and unconscious (type 1) determinants, the suitability of such models for mapping this process level might be questioned. However, as demonstrated below, it is possible to apply the models to both type 1 and type 2 processes. The former were split into two categories (sections 5.4.1 and 5.4.3) to reflect the distinction, drawn in section 5.3.2.1, between impulsive and habitual type 1 processes. This resulted in three targets for self-regulation: the impulsive self (type 1), the rational self (type 2) and the habitual self (type 1). (N.B. Although impulsive and habitual behaviours can be seen as overlapping, the intended distinction was for impulsive to refer to behaviours characterised as reactive and emotion driven, and habitual to refer to behaviours characterised as automatic, unconscious and routine.)

5.4.1 Conscious self-regulation of impulsive self (type 2 addressing type 1)

Primed by genetic predispositions and learned associations, type 1 impulses are deeply ingrained and difficult to change (Evans, 2008; Strack & Deutsch, 2004). The processes are generally too fast and pervasive for slow, limited capacity, type 2 processing to intervene directly. The route envisaged for conscious intervention was therefore indirect. It entailed helping participants to understand the conditions under which certain type 1 reactions are triggered and then either to modify their behaviour to avoid triggering situations, e.g., moments of ego depletion (Appendix D7, question 9), or to modify their environment to trigger more appropriate reactions (Appendix D7, question 13). (N.B. Modifying one's behaviour and environment addresses two of the three components of Bandura's (1978) triadic model of reciprocal determinism. Habit formation (section 5.4.3) can be viewed as addressing the third, i.e., the self or person, through attempting to automate internal cognitive processes.) As such efforts to address type 1 processes were consciously driven, they were amenable to representation using social cognition models such as SCT, as outlined in the next section.

5.4.2 Conscious self-regulation of rational self (type 2 addressing type 2)

As explained in the previous section, even when addressing type 1 processes, the action taken relied on type 2, conscious rational processing. Consequently, the SCT constructs outlined below could be applied to both direct regulation of type 2 processes and indirect regulation of type 1 processes.

5.4.2.1 Self-efficacy and outcome expectations

In the revised intervention for Study 2, these were addressed through:

- **persuasion** – via general introductions in the training guidance notes and the ‘tips’ sections of the ‘More Info’ boxes for each activity;
- **modelling** – via the ‘example answers’ provided in the ‘More Info’ boxes;
- **personal mastery** – through participants repeatedly performing the activities and witnessing the results.

The results of Study 1 suggested, however, that a minimum threshold of general self-efficacy might be required before participants are able to benefit from such self-administered training, as the two participants with the lowest generalized self-efficacy scores failed to engage with the intervention. As self-efficacy or sense of personal control features prominently in explanations of anxiety and depression [e.g., Walker’s (2001) unifying theory of control], measures for anxiety and depression were also added (see Chapter 6).

The feedback from Study 1 had also demonstrated differing expectations concerning the types of areas where progress could be made, e.g., work task issues rather than family relationships. The intervention training guidance notes for Study 2, therefore, emphasized focusing the writing activities on areas where participants perceived they had greater control and chances of success.

5.4.2.2 Goals

Goals were addressed by requiring participants to formulate their intentions in writing. The SI activities addressed distal goals and the TI activities proximal goals. To avoid the problem of perceived artificiality of some of the goal-setting activities highlighted in Study 1, participants were not obliged to write anything under a particular activity heading if nothing appropriate came to mind.

Goals with respect to the writing activities themselves were addressed by questions on the last pages of the training guidance notes (Appendix D5) and strategic intelligence session (Appendix D6). These asked participants to specify exactly when they planned to carry out the various writing activities.

5.4.2.3 Behaviour

The behaviour, in terms of participants' writing activities, was captured directly online. The actions subsequently carried out in their everyday lives, that the writing referred to, were captured indirectly via their feedback in the PI section.

5.4.2.4 Sociostructural facilitators and impediments

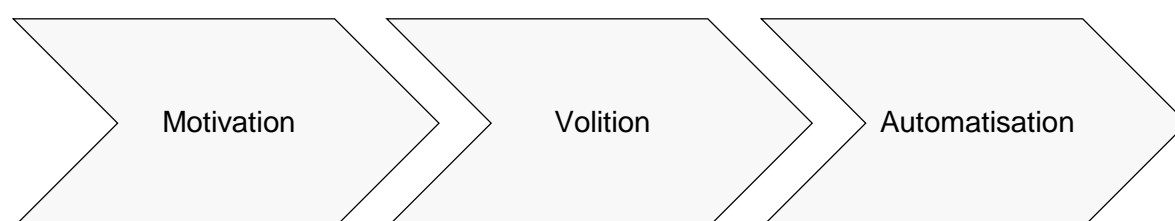
Sociostructural factors refer to aspects of the physical or social environment that may facilitate or impede performance of the health behaviour in question. There are many possible factors that could be explored. Three factors highlighted by the qualitative feedback from Study 1 (section 4.4.2.3) were management support, job-role autonomy and recent environmental change. Questions were therefore added to the Study 2 questionnaire (Appendix D4) to explore these issues further.

Although, as indicated above, the main psychological constructs of Bandura's (1986, 2001) social cognitive theory had been addressed, there were other psychological or person-related variables that appeared worthy of investigation. The feedback from Study 1, for example, had highlighted age, gender, emotional stability, extraversion, openness to experience, need for cognition, tangible social support, and information processing style as possibly relevant variables. These were therefore also investigated in Study 2.

5.4.3 Conscious self-regulation of habitual self (type 2 becoming type 1)

Section 5.4.1 addressed efforts to overcome unhelpful impulsive type 1 behaviours and prompt more helpful reactions. This section addresses attempts to turn helpful type 2 behaviours into automatic type 1 behaviours, through habit formation. It can be considered a third phase of behaviour change, as illustrated in Figure 5.2 below.

Figure 5.2 Phases of behaviour change



Armitage & Conner (2000) classified SCT as a motivational model, i.e., explaining the cognitive determinants of individuals' decisions to perform certain health behaviours. However, intentions alone are not enough, as highlighted by the intention-behaviour gap (e.g., Sheeran, 2002). Motivational models have therefore been extended to address the process by which intentions are turned into action. Armitage & Conner (2000) referred to this additional step as behavioural enaction (also termed 'volition') and highlighted two models: Gollwitzer's (1993) implementation intentions and

Bagozzi's (1992) theory of trying. The thesis has utilised implementation intentions, as they are more parsimonious and have extensive evidence to support their efficacy (e.g., Gollwitzer & Sheeran, 2006; Adriaanse, Vinkers, De Ridder, Hox, & De Wit, 2011).

The volitional phase can draw on limited self-control resources required for type 2 conscious attention and goal-directed effort. At the end of any period of training, when other priorities and demands come to the fore, these efforts and behaviours may dissipate. The third phase of behaviour change, therefore, involves attempting to cement any changes by transferring their governance from type 2 to type 1 processes, i.e., through automatisisation or habit formation.

The revised intervention for Study 2, therefore, included the following elements to promote habit formation highlighted by Lally & Gardner (2013):

- Encouraging participants to repeat their writing sessions in a consistent setting, i.e., a particular time and place, each working day. (N.B. Target writing duration was also reduced from 20 to 10 minutes, which the feedback from Study 1 had suggested would be more acceptable.)
- Promoting implementation intention formation to increase repetition of the behaviour.
- Creating the expectation that repetition would lead to automaticity, resulting in greater ease of performance and less effort.
- Encouraging PI self-monitoring of self-regulatory achievements to enhance satisfaction with writing outcomes, which according to Rothman (2000) should reinforce behavioural maintenance.
- Enhancing intrinsic motivation, by allowing participants to choose when and where they performed their writing activities.

Other elements included:

- Trying to graft new self-regulatory behaviours onto existing habits, e.g., by extending 'to do' lists.
- Designing the intervention so that participants were quickly introduced to the end activities, which were then practised daily for the remainder of the intervention. Thus, the habit formation process was not a separate stage, but integrated from the very start.

This section (5.4) has focused on the motivational, volitional and automatisisation processes addressed in the design of the revised intervention. The heading for this section (motivation/learning/reinforcement process) encompasses more than just the

components of Figure 5.2 however. The reason is that for a relatively straightforward health behaviour such as jogging, supporting enactment or volition may be enough to bridge the intention-behaviour gap. It should also be reasonably apparent whether or not a particular individual is physically capable of or suited to the activity. However, for complex self-regulatory coping behaviours, there is far more to learn and it is not readily apparent who may or may not be suited to particular activities.

There are many fields of knowledge, therefore, that could possibly add further useful insights to this process level. Advances in computer assisted learning and educational theory, for example, have brought abstract learning processes under closer scrutiny. As demonstrated by Vogel-Walcutt, Gebrim, Bowers, Carper, & Nicholson (2011), there is considerable scope for exploring the impact of different theoretical approaches to knowledge acquisition.

Achieving the right balance is also critical, as illustrated by Vygotsky's (1978) zone of proximal development. If tasks are too difficult, learners become confused; if too easy, they become bored. A measure to address this and take account of individual differences, was to present each writing activity with 3 levels of detail, as indicated in section 5.5.2 below.

A further measure to facilitate learning was to attempt a form of 'scaffolding' (Wood, Bruner, & Ross, 1976). As noted by Verenikina (2003), there are differing interpretations of scaffolding. The form adopted here, outlined in the next section, was very basic and essentially involved breaking down the SI, PI and TI concepts into small manageable steps/activities.

As indicated in the next section, a lot more could be added, particularly in terms of computer technology, to assist learning. However, as stated earlier, the primary focus of this thesis was to develop and test the core and enhanced self-regulatory concepts, as they constitute the foundation upon which other process levels will subsequently be built. Opportunities for further development of the other process levels are discussed in Chapter 9.

5.5 Communication/presentation process

Two key issues addressed were mode of presentation and organisation of content.

5.5.1 Mode of presentation

This was changed from paper-based to online. The feedback from Study 1 had suggested that most participants were open to the idea of writing online. However, two issues highlighted were security and confidentiality.

The first was addressed by setting up the whole intervention on a secure Bristol Online Survey platform (<https://www.survey.bris.ac.uk/>). This is an online survey tool created by the University of Bristol. It uses a secure communications protocol (HTTPS: Hypertext Transfer Protocol Secure), which authenticates the website and provides encryption of communication between client and server. Access to the survey data by researchers is also password protected.

Confidentiality was addressed by various steps to anonymise all online data entry. Participants logged on using a three digit code number. They were also advised (via the participant information sheet and online instructions) to anonymise the content of their own writing entries by using initials or abbreviations rather than the names of actual people or places.

Use of the Internet created additional opportunities for enhancing the effectiveness of the intervention. As part of a review of Internet-based behaviour change interventions, Webb, Joseph, Yardley, & Michie (2010) created a coding scheme for mode of delivery options used to enhance intervention effectiveness. The options selected for the intervention for Study 2 from Webb et al.'s (2010) coding scheme were as follows:

1. Automated functions:

- Use of an enriched information environment: this was relatively simple, i.e., 'More Info' pop-up boxes, but it enabled additional tips and information to be positioned next to the relevant activities, which was an improvement on the Study 1 manual.
- Use of 'automated' follow-up messages: these were tips and reminders included at the end of the interim progress questionnaires (Appendices D8 and D9).
- N.B. These options were not automated in the full sense of the word, as they were limited by the functionality of the Bristol Online Surveys platform.

2. Communicative functions:

- Access to advice: provided by the researcher, i.e., for administrative or technical issues.

3. Use of supplementary modes:

- Email: for organising participation and sending reminders.

Though these mode of delivery options were very basic, this was not a problem, as the main focus was on developing and testing the core SI/TI/PI concepts and activities.

Webb et al. (2010) also noted navigational format as a further mode of presentation issue. The format used for the intervention for Study 2 was a tunnel design (Danaher, McKay, & Seely, 2005), as commonly used for online surveys. This constituted a form

of choice architecture (Thaler & Sunstein, 2008), which afforded more control over the participant experience than the manual-based intervention. There was no choice of navigation route. Participants were obliged to work through the materials in the order presented online, i.e., training guidance notes first, followed by the strategic intelligence session, followed by the daily focus sessions. The provision of a clear route through the writing activities, taking one step at a time, with clear guidelines and prompts, constituted a form of 'scaffolding', designed to make the learning process simpler for participants. The writing activities within each section (i.e., SI/PI/TI) were optional, but all were retained on the viewing pages to keep them accessible.

5.5.2 Organisation of content

In line with the feedback from Study 1, the volume was reduced. The intervention was split into three survey components. The components were:

1. Training guidance notes – These provided the overview and rationale for the intervention, at the end of which participants could indicate whether they wished to proceed or withdraw from the training. The language was kept at a similar level to Study 1. For the intervention for Study 2, the Flesch reading ease was 55.2 (55.7 – Study 1) and the Flesch-Kincaid grade level was 9.5 (9.4 – Study 1).
2. Strategic intelligence (SI) session (one-off session).
3. Daily focus session comprised of a perceptual intelligence (PI) section and a tactical intelligence (TI) section.

A consistent presentation format was used for each writing activity, with three levels of detail:

1. Prompt: main question in bold type.
2. Hints: more expansive, illustrative questions, in normal type.
3. More information box: more detailed advice, consisting of example answers and tips and explanations.

The presentation was very basic in terms of style and colours, as this was restricted by the survey format options. The only diagram used was the stress imbalance model from Study 1. This was incorporated into the first section of the training guidance notes. As previously stated, the dual-process goal-momentum model was not used, as it was not an established model and was still under development.

Webb et al.'s (2010) meta-analysis had found that the more behaviour change techniques included in interventions, the greater the effect size. Opportunities were therefore taken to apply additional behaviour change techniques at the communication level. The principal addition was the use of persuasive arguments, a recognised

behaviour change technique (Michie et al., 2013). The following persuasion principles (Cialdini, 2001) were applied to try to further enhance participant engagement in the training:

1. **Authority** – e.g., emphasizing credibility and expertise by presenting the training as part of a University of Bath research programme.
2. **Social proof** – e.g., citing that most participants in earlier piloting had completed the training with little difficulty.
3. **Scarcity** – e.g., stressing only a limited number of training places available.
4. **Consistency** – e.g., presenting participants with the option of withdrawing or actively committing to the training and requiring them to specify when they would perform the various activities.
5. **Reciprocity** – e.g., asking any participants who opted to withdraw if they would like to receive a copy of the study results before asking them if they would agree to completing an exit questionnaire.

Other key communication principles applied were:

1. **Choice** – Use of language emphasizing participant choice (e.g., can, could, rather than must, should), as this has been found to enhance autonomous motivation (e.g., Vansteenkiste, Simons, Lens, Sheldon, & Deci, 2004).
2. **Concreteness** – The qualitative feedback from Study 1 had suggested the more concrete, less abstract the concept, the easier to apply. Hence concrete workplace examples were provided for each writing activity. Also, as mentioned earlier, concrete metaphors of ‘child’, ‘adult’ and ‘robot’ were suggested for ‘impulsive’, ‘rational’ and ‘habitual’ self. This was an oversimplification designed to facilitate rapid concept comprehension compatible with a type 1 processing style. A further aspect of concreteness involved encouraging participants to be concrete and specific in their PI appraisals, as this has been found to reduce depressive rumination (e.g., Watkins, Baeyens, & Read, 2009).

5.6 Research process

In section 4.5.2.5 of Chapter 4, it was noted that trade-offs are sometimes necessary when developing or evaluating interventions. Two such trade-offs concerning the design of the intervention for Study 2 are highlighted below:

5.6.1 Short-term versus long-term effects

Strategic intelligence is fundamentally important to goal momentum and sustainable well-being, as the nature of the goals people choose to pursue, shapes their life experiences and the amount of stress encountered. Study 1, however, highlighted the

difficulty in getting people to fundamentally reappraise their long-term goals, particularly when stressed.

Martin & Tesser's (2006) multiple goal process theory of rumination offers an explanation of why people may resist straying from a sub-optimal life niche (i.e., a situation where adequate progress is not being achieved on all key higher order life goals). The current life niche can be seen as a kind of working compromise. Venturing beyond this requires effort and compromises between goals. Major change may be uncomfortable and offers no guarantee that it will lead to a more optimal future life niche. Consequently, people remain stuck in suboptimal situations.

Martin & Tesser (2006) noted that traumatic life events can often prompt people to reappraise their goals. Other than trauma, a major change of environment (e.g., as experienced by participant 021) may prompt such a shift. Targeting people in such situations could generate more fundamental changes with respect to the SI component of interventions. However, as recruitment was focused on established workforces, it was considered unlikely that many participants would be in a position to fundamentally reappraise their goals. The SI objectives for the intervention were therefore kept relatively simple and short term, i.e., limited to addressing key sources of stress, as explained in section 5.3.1.

5.6.2 Sustainability versus cortisol awakening response

A key research aim had been to determine the level of self-regulatory change required to influence cortisol levels in a naturalistic environment. Prior research (e.g., Dean, 2009) had suggested that an initial area where changes might be detected would be the cortisol awakening response (CAR), particularly if the writing sessions were completed just before sleep. This had therefore been incorporated into the Study 1 instructions. However, most participants had appeared reluctant to do this, preferring to complete the activities earlier in the day, while still in 'work mode'. As stress is long-term issue, a priority was to ensure that any adaptive behaviour change was sustainable. If optimal timing for the CAR was not sustainable for participants, then it was of dubious value to long-term health. Consequently for Study 2, participants were given the freedom to schedule their writing sessions when most convenient for them.

5.7 Conclusion

This chapter has set out the theoretical and empirical rationale for the design of the online goal-momentum intervention developed for Study 2. Key changes from the original intervention included attempts to reduce perceived artificiality of some tasks, enhance critical self-awareness, and address adaptive and maladaptive type 1 processes and behaviours. The results of Study 2 are presented in the next chapter.

CHAPTER 6: STUDY 2 – TESTING OF ONLINE INTERVENTION

6.1 Introduction

This chapter describes Study 2, which was designed to investigate the impact of the revised goal-momentum intervention outlined in Chapter 5. The main changes for Study 2 were:

- **Intervention:**
 - online rather than paper-based;
 - addressing type 1 and type 2 cognitive processes rather than just type 2;
 - more succinct instructions and streamlined activities;
 - more frequent but shorter writing sessions (5 x 10 minutes instead of 3 x 20 minutes per week).
- **Research design:**
 - greater emphasis on quantitative analysis (N.B. The qualitative component was predominantly used to further refine the intervention – see Chapter 7);
 - larger sample to generate power for inferential statistics;
 - new measures to address additional issues raised by Study 1;
 - online capture of writing content for direct rather than self-reported measurement of adherence;
 - assessment across five time points (i.e., baseline, one, three, six weeks and one year), as opposed to two (i.e., baseline and four weeks) for Study 1.

6.1.1 Aims, rationale and hypotheses

There were four principal aims for the study:

Aim 1: To investigate the possible nature and timing of any effects of the intervention on participant psychological well-being

In Study 1, only one participant had registered consistent improvements across a range of self-report measures of psychological well-being. The majority had shown mixed results. The revised intervention was designed to try to generate more consistent and widespread improvements. However, given the relative complexity of the training and the time required to learn the techniques, it was unclear how long it would take for any possible improvements to emerge. A key aim of Study 2, therefore, was to determine the time course of any changes. This would ultimately help to provide realistic outcome expectations for future recipients of training. It would also help to determine the optimal timing of the cortisol sampling for Study 3. The first hypothesis, therefore, was:

Hypothesis 1: That engagement in the training would be associated with positive changes in scores on self-report measures of psychological well-being between baseline and the end of the six week intervention. There was no prediction regarding the rate of change, i.e., at which of the measurement points (i.e., one week, three weeks or six weeks) changes might be detectable.

Aim 2: To identify factors influencing the outcomes of the intervention

In Study 1, the person who reported the most widespread improvements appeared to invest the most time in the writing activities. In Study 2, therefore, it was anticipated that participant engagement or adherence would predict the degree of improvement in outcome variables. The second hypothesis, therefore, was:

Hypothesis 2: That greater engagement (measured in terms of the number of completed writing sessions) would be associated with greater improvements in scores on self-report measures of psychological well-being.

Beyond this, there were many person and environment factors that could possibly influence (a) participant engagement in the writing activities, (b) how participants act on what they have written, (c) how successful their actions are in changing their situations, and (d) the impact of any changes on self-reported well-being. However, the greater the distance between possible predictor and outcome variables, the greater the difficulty in establishing clear causal relationships. The next stage of analysis, therefore, focused on the most proximal of relationships, i.e., between person and environment factors and engagement in the writing activities. The factors chosen stemmed from the theoretical models underpinning the intervention and from the results of Study 1. The third hypothesis, therefore, was:

Hypothesis 3: That participant engagement (measured as completed writing sessions) would be associated with the following baseline (Time 1) measures (theoretical or empirical justification shown in brackets):

Person factors

- Self-efficacy (Social cognitive theory: SCT: Bandura, 1986)
- Outcome expectations (SCT)
- Consideration of future consequences (Dual-process goal-momentum model: Chapter 5)
- Big five personality factors (Study 1)
- Participant age (Study 1)
- Type 1 processing – ‘Faith in intuition’ (see section 6.2.6) (Dual-process goal-momentum model)

- Type 2 processing – ‘Need for cognition’ (see section 6.2.6) (Dual-process goal-momentum model)

Environment (sociostructural) factors

- Job-role autonomy (Study 1)
- Management support (Study 1)
- Tangible social support (Study 1)
- Recent environmental change (Study 1)

Aim 3: To investigate the sustainability of writing activities and any effects beyond the initial study

To maintain any health benefits over the longer term, it would seem reasonable to assume that the relevant behaviour change would need to be sustained. To test this, participants were informed that they could continue their self-regulatory writing activities online beyond the end of the study. The results were to be subsequently assessed with a twelve-month follow-up online questionnaire. The fourth hypothesis, therefore, was:

Hypothesis 4: That if participants continued their writing activities over the course the year, any improvements in scores on self-report measures of psychological well-being (as tested in hypothesis 1) would be maintained. Conversely, if the writing activities were not continued, the prediction was that any improvements in scores would not be maintained.

Aim 4: To use the qualitative feedback from participants to further enhance the intervention for Study 3

There were two main uses envisaged for the qualitative data. If the intervention failed to generate any significant improvements, it was anticipated that the qualitative data (i.e., participants’ online writing entries and their responses to open questions in the various questionnaires) might yield insights into possible problems and remedies. If the intervention proved successful, the aim was to use the qualitative data to seek to further improve its effectiveness.

6.2 Method

6.2.1 Design

The format used for the study can be described as a one-group pretest-posttest quasi-experimental design, with four posttests to address the time course of any changes (O1 X O2 O3 O4 O5: Harris et al., 2006). It relied on both quantitative and qualitative methods and can be categorised as a mixed methods, concurrent embedded

experimental design (Creswell & Plano Clark, 2007; Creswell, 2009), or more accurately, quasi-experimental design. The primary data collected was quantitative. The secondary, qualitative data was used to gain insights into any changes and to identify possible opportunities for improvements.

6.2.2 Power and sample size calculations

A power calculation was performed using G*Power 3.1.5 (Faul, Erdfelder, Lang, & Buchner, 2007) to determine the required sample size. Set input parameters were: α error probability of .05, power of .80, one group and four measurements (for the main part of the study). For correlations among repeated measures, the default value of .5 was considered a reasonable minimum threshold, as Study 1 had shown several variables to have higher correlations across time. The default value for the nonsphericity correction (ϵ) was 1. This gave a required sample size of 24 to detect a medium-sized effect ($f = 0.25$). However, a more conservative approach was adopted, allowing for the possibility of what Field (2013) described as a large violation of sphericity (i.e., $\epsilon < .7$). Inputting a value of $\epsilon = .6$ generated a required sample size of 33. An additional 20 percent was added for attrition and an internal target set for 40 participants. The external target subsequently advertised was 50 to add a further margin of safety.

6.2.3 Participants

Participants were recruited from the University of Bath and the Open University. The majority (88 per cent) were from the former. The inclusion criteria were the same as for Study 1, i.e., full-time, office-based administrative staff, aged between 18 and 65. No financial incentives were offered. Participants were simply offered a report of the eventual study findings.

6.2.4 Procedure

Participants were recruited via a request for volunteers on university webpages or by email. Two webpages were used: (a) the University of Bath Department of Psychology 'Participate in projects' webpage (permanent display – wording shown in Appendix D1); and (b) the University of Bath 'News and Info' homepage (temporary display – 3 days). There were also two forms of email communication highlighting links to the 'Participate in projects' web page: (a) a faculty weekly update sent to faculty staff and students; and (b) a one-off message sent to departmental staff mailing lists.

Slower than anticipated recruitment at the University of Bath (mainly due to difficulty obtaining permission from 'gate-keepers' to email staff) prompted efforts to recruit additional participants via a link posted on the Open University intranet.

Those interested in participating were directed to the participant information sheet (Appendix D2) via a link on the Department of Psychology 'Participate in projects' webpage. The page also included a link to the study consent form (Appendix D3). On receipt of the completed consent form, participants were emailed an outline of the training, which included a link to the initial baseline questionnaire. On the final page of the questionnaire, there was a link to the first element of the intervention, the training guidance notes (Appendix D5). The last page of the notes provided a link for the next step, the one-off strategic intelligence (SI) session (Appendix D6). This in turn provided a link for the subsequent daily focus sessions (Appendix D7), comprised of perceptual intelligence (PI) and tactical intelligence (TI) activities. The provision of links in this way ensured the correct order was followed and enabled participants to proceed at their own pace.

One week after commencing their first daily focus session, participants were sent a link for the first interim progress questionnaire (Appendix D8), by which time they should have completed five daily focus sessions. A second interim progress questionnaire (Appendix D9) was scheduled for the end of the third week, by which time they should have completed 15 daily focus sessions. At the end of this questionnaire, participants were given the option to continue their daily focus sessions for one more week (i.e., five more sessions) or three more weeks (i.e., 15 more sessions). This step was designed to help differentiate participants in terms of extrinsic (compliance) versus intrinsic motivation, creating a greater spread of completed writing sessions that would help to test hypotheses 2 and 3. Three weeks after completion of the second interim progress questionnaire, participants were emailed the link for the final questionnaire (Appendix D10).

Participants had been instructed (within their strategic intelligence session) to note the target dates for completion of each questionnaire and the appropriate questionnaire link was emailed to them the evening before each appointed date. If participants failed to complete a questionnaire on the target date, they were sent a reminder by email. If they chose to withdraw at any stage, they were asked to complete an exit (termed 'follow-up') questionnaire, which included the same scales as the interim progress questionnaires.

At the end of the final (week 6) questionnaire, participants were given the option of continuing their daily focus sessions on a replica webpage. This was monitored to see how many persisted with the activities.

Six- and twelve-month follow-up questionnaires had been planned. However, the six-month follow-up coincided with preparations to launch Study 3, with the result that only

the twelve-month follow-up (Appendix D11) proved feasible. On completion of the questionnaire, participants were provided with a report of the main study findings (final section of Appendix D11).

6.2.5 Materials

All the questionnaires and training materials were set up on the Bristol Online Survey website (<https://www.survey.bris.ac.uk/>). The various components and estimated participant completion times are set out in Table 6.1 below.

Table 6.1 Study 2: Components and estimated timings

Component	Appendix	Target week	Estimated time required
Questionnaire 1 – parts 1 and 2	D4	1	2 x 20 minutes
Training guidance notes	D5	1	20 - 25 minutes
Strategic intelligence session	D6	1	about 30 minutes
Daily focus sessions	D7	1 to 4 (or 1 to 6)	5 - 10 minutes per day
Interim progress questionnaire 1	D8	1-2	15 minutes
Interim progress questionnaire 2	D9	3-4	15 minutes
Exit questionnaire ¹	Same as D8	On withdrawal	15 minutes
Final questionnaire – parts 1 and 2	D10	6-7	2 x 20 minutes
12-month follow-up questionnaire	D11	52	20 minutes

¹ For participants withdrawing from study.

6.2.6 Measures

The measures used are outlined below. New measures added for Study 2 are described in full. The measures previously used are described in Chapter 4.

1. **Standard sociodemographic questions**

The questions are shown in full in Appendix D4.

2. **Positive and Negative Emotional Style Scale (PNES)** – 12 items (Cohen et al., 2006). Described in Chapter 4, section 4.2.5.2.

3. **Perceived Stress Scale (PSS)** – 10 items (Cohen & Williamson, 1988). See section 4.2.5.2.

4. **Hospital Anxiety and Depression Scale (HADS)** – 14 items (Zigmond & Snaith, 1983). This scale was used to measure symptoms of anxiety and depression. It was added as both constructs were expected to be positively influenced by enhanced capacity to make progress towards goals. According to Walker's (2001) unifying theory of control, increasing the perceived probability of achieving desired outcomes should reduce depression (perception of no control) and anxiety (perception of uncertainty/unpredictability).

Participants were required to rate, on a four point scale, the frequency or extent to which 14 statements (Appendix B10) applied to them over the previous week. The odd items (of which 1, 3, 5, 11 and 13 were reversed) were summed to produce a total score for anxiety. The even items (of which 6, 8 and 10 were reversed) were summed to form a depression score. A review by Bjelland, Dahl, Haug, & Neckelmann (2002) concluded that the scale performed well as a measure for identifying and gauging the severity of anxiety and depression in the general population, as well as in clinical samples. They found Cronbach's α for HADS-anxiety ranged from .68 to .93 (mean .83) and for HADS-depression from .67 to .90 (mean .82).

5. **Goal-Oriented Subjective Status Scale (GOSS)** – 6 items (Yardley & Dibb, 2007). See section 4.2.5.2.
6. **Habit Index of Negative Thinking (HINT)** – 12 items (Verplanken et al., 2007). See section 4.2.5.2.
7. **Work-Related Basic Need Satisfaction Scale (W-BNS)** – 18 items (Broeck, Vansteenkiste, Witte, Soenens, & Lens, 2010). The strategic intelligence component of the intervention was based on self-determination theory (SDT: Ryan & Deci, 2000) and sought to enhance participants' sense of autonomy, competence and relatedness in the workplace. This scale was devised by the authors specifically to address such work-related needs. Participants were required to rate, on a five point Likert scale, the extent to which they disagreed or agreed with 18 statements (Appendix B11). Items 3, 6*, 9*, 12, 15 and 18* (* reversed) were summed to form a total for autonomy; items 2*, 5, 8, 11*, 14 and 17, similarly for a total for competence and 1*, 4, 7*, 10, 13* and 16 for relatedness. The scale was validated in Dutch and translated by the authors into English using the translation / back-translation procedure. No validated English version was available at the time of the study. The authors reported support for the three factor structure of the scale, as well as discriminant, criterion-related and predictive validity for the three subscales. Average Cronbach's α scores reported were .81, .85, and .82, for autonomy, competence, and relatedness satisfaction, respectively.
8. **Generalized Self-Efficacy Scale** – 10 items (Schwarzer & Jerusalem, 1995). See section 4.2.5.2.
9. **Revised Life Orientation Test (LOT-R)** – 10 items (Scheier et al., 1994). See section 4.2.5.2.

10. **Ten Item Personality Inventory (TIPI)** – 10 items (Gosling et al., 2003). See section 4.2.5.2.
11. **Rational Experiential Inventory (REI)** – 10 items (Epstein, Pacini, Denes-Raj, & Heier, 1996). This was used in place of the 18 item (NCS) need for cognition scale (Cacioppo et al., 1984), used in Study 1, for two reasons. Firstly, it included a shorter five item version of the NCS and hence could help reduce participant burden. Secondly, it was based on the dual-process model distinction discussed in Chapter 5. The five ‘need for cognition’ items addressed rational, type 2 processing. The other five items, termed ‘faith in intuition’ by the authors, addressed experiential, type 1 processing. In this chapter these two subscales are referred to as REI-type 1 and 2. The former (type 1) consisted of items 2, 4, 6, 8 and 10 (see Appendix B16) from which a mean score was calculated. The latter, from items 1*, 3*, 5, 7 and 9* (* reverse scored). Again, a mean score was calculated. Ratings were based on a five point Likert scale that judged the ten statements as ranging from ‘completely false’ to ‘completely true’. The authors reported support for the two factor structure of the scale and satisfactory construct validity. Internal reliability was reported as $\alpha = .72$ for REI-type 1 and $\alpha = .73$ for REI-type 2.
12. **Consideration of Future Consequences Scale (CFC)** – 12 items (Strathman, Gleicher, Boninger, & Edwards, 1994). This scale was added to explore the possible influence of differences in present versus future time orientation, the core distinction at the heart of the dual-process goal-momentum model (Figure 5.1 in Chapter 5). The scale measures the extent to which people consider possible future outcomes of present behaviours and the extent to which such outcomes influence present behaviours. Participants were required to rate, on a five point Likert scale, the extent to which 12 statements (Appendix B13) were uncharacteristic or characteristic of themselves. Items 3, 4, 5, 9, 10, 11 and 12 were reverse scored and then the mean taken. The authors reported acceptable construct and predictive validity, and acceptable internal reliability with Cronbach’s α scores ranging between .80 and .86.
13. **Brief Interpersonal Support Evaluation List (ISEL)** – 12 items (Cohen et al., 1985). See section 4.2.5.2.

Appendix D12 shows the stages, order of use and Cronbach's α scores for the scales and subscales used in the study. The scheduled timing of the questionnaires was as follows:

- **Time 1** – Baseline
- **Time 2** – 1 week after start (5 daily focus sessions)
- **Time 3** – 3 weeks after start (15 daily focus sessions)
- **Time 4** – 6 weeks after start (30 daily focus sessions)
- **Time 5** – 12 months after baseline

A Cronbach's α score of .7 was used as a cut-off point for acceptability (Kline, 1999). Thus, TIPI agreeableness and emotional stability were not used. TIPI conscientiousness was borderline, as was W-BNS autonomy (T1). Item deletion was considered for the latter, but no changes would have significantly improved reliability across time points.

6.2.7 Data preparation

The BOS survey data was imported into SPSS following the same procedure as described for Study 1. Again, there were no missing values for the main scale measures, due to the mandatory response settings used for these elements of the questionnaires. The data was then screened for accuracy of data entry (i.e., obvious errors), outliers and normality of distribution.

To check for univariate outliers, boxplots were created for all relevant variables and time points. Where the boxplot indicated outliers, standardized z scores were generated for more detailed assessment. All variables, however, were within an acceptable range of $z = \pm 3.29$ (Tabachnick & Fidell, 2013).

Normality of distribution was checked using Kolmogorov-Smirnov (K-S) tests with Lilliefors significance correction and the Shapiro-Wilk test, which is slightly more powerful. As highlighted by Field (2013), however, such tests are not completely reliable and so indices of skewness and kurtosis were also reviewed. Where necessary, transformations were conducted to try to achieve values as close to zero as possible and within the ± 1 range recommended by Hair, Anderson, Tatham, & Black (1999). As suggested by Tabachnick & Fidell (2013), square root, log and reciprocal transformations were respectively applied to correct for moderate, substantial and severe positive skew, with reversed versions applied to negative skew. The following transformations yielded improved normality distributions: PNES negative affect (square root), HADS depression (logarithm), total writing sessions (reversed square root), ISEL tangible social support (reversed square root), consideration of future consequences

(reversed square root), W-BNS competence (reversed logarithm), TIPI conscientiousness (reversed logarithm), REI-type 1 (reversed logarithm), ISEL appraisal social support (reversed logarithm) and REI-type 2 (reversed reciprocal).

As transformations had to be applied across up to five time points, it was not always possible to obtain consistently optimal distributions, as enhancements to some time points resulted in over compensation for others. A further measure, therefore, to address normality violations was to use, where available, a robust method advocated by Field (2013), namely bootstrapping using bias corrected and accelerated confidence intervals (Efron & Tibshirani, 1993). These offer more reliable estimates of population values, as they do not rely on assumptions of normality or homoscedasticity.

Homogeneity of variance was checked using Mauchly's test of sphericity in repeated-measures ANOVAs and appropriate corrections were applied if the test was significant.

6.2.8 Data analysis

Statistical analyses were conducted using IBM SPSS version 21. Data was analysed using repeated-measures ANOVAs to investigate patterns of change in outcome variables. Paired-samples t-tests were used for more specific comparisons. Relationships between variables were investigated using correlation analyses.

Significance levels (2-tailed) were initially set at $\alpha = .05$. Where appropriate, Bonferroni corrections were applied to reduce the risk of Type I error from multiple comparisons. Bootstrapping was based on the SPSS default setting of 1000 bootstrap samples, as recommended by Field (2013).

6.2.9 Ethics

Ethical approval for Study 2 was granted by the University of Bath, Department of Psychology Research Ethics Committee under reference number 12-048.

6.3 Results

6.3.1 Sample characteristics

The target had been to recruit 25 women and 25 men. However, this was not achieved. Of the 33 participants who began the study, just five were male. The mean age of the participants was 42.21 years ($SD \pm 10.49$) and ranged from 24 to 62. The mean number of working hours reported was 37.44 (± 4.11) and ranged from 30 to 45. A summary of key categorical data is provided in Table 6.2 on the next page.

Table 6.2 Study 2: Participant sociodemographic characteristics

Variable	N = 33	%
Gender		
Female	28	84.8
Male	5	15.2
Ethnicity		
White	31	94.0
Non-white	2	6.0
Marital status		
Married/partnered	20	60.6
Unmarried/unpartnered	13	39.4
Children		
Children	18	54.5
No children	15	45.5
Education		
Up to A level	6	18.2
HE certificate/diploma	6	18.2
UG degree	11	33.3
PG degree	10	30.3
Employer		
University of Bath	29	87.9
Open University	4	12.1

6.3.2 Attrition and writing task adherence

Table 6.3 on the next page shows the attrition rates by gender. The two participants who withdrew before completing the initial questionnaire were both male and from the Open University. All participants who withdrew after completing questionnaire 1 (Time 1) were invited to complete an exit questionnaire, which included the same scales as the interim progress questionnaires 1 and 2. The two participants who withdrew before completing the training guidance notes, failed to complete an exit questionnaire. However, the seven participants who withdrew between completing the training guidance notes and interim progress questionnaire 1 (Time 2), all completed exit questionnaires. Thus, there were Time 1 and Time 2 scores available for all participants who read the training guidance notes. Consequently, it was possible to perform intention-to-treat as well as per-protocol analyses (see section 6.3.4) for all 31 participants exposed to the training, without having to resort to estimated or dummy (e.g., last observation carried forward) Time 2 scores. Exclusion of the two participants who completed questionnaire 1, but did not read the training guidance notes, was justified on the grounds that they did not start the training. The term ‘per-protocol’ refers to the 24 participants who read the training guidance notes, attempted writing sessions

and completed the first four questionnaires (i.e., up to six weeks). The term is not used in its purest sense, however, as no participants adhered 100 per cent to the full protocol, i.e., by completing 30 writing sessions over six weeks. Adherence was not a black and white issue, but rather a question of degree.

Table 6.3 Study 2: Participant attrition rates by gender

Stages completed	Female	Male	Total
Signed consent form to participate	28	7	35
Completed questionnaire 1	28	5	33
Completed training guidance notes	27	4	31
Completed strategic intelligence session	25	3	28
Began daily focus sessions	23	3	26
Completed interim progress questionnaire 1	21	3	24
Completed interim progress questionnaire 2	21	3	24
Completed final questionnaire	21	3	24
Completed 12-month follow-up questionnaire	18	3	21

Table 6.4 below illustrates the differing levels of engagement in terms of the number of writing sessions (strategic intelligence plus daily focus) performed by the 31 participants who completed the training guidance notes. The target was five sessions per week for four weeks, with a further two weeks of optional practice. The highest number of writing sessions for those continuing beyond four weeks was 27 (two participants).

Table 6.4 Study 2: Participant adherence by number of writing sessions

Variable	N = 31	%
Adherence		
No sessions	3	9.7
1 – 10 sessions	9	29.0
11 – 20 sessions	10	32.3
21 – 30 sessions	9	29.0

In total, 36 strategic intelligence sessions (some participants used this more than once) were completed online and 434 daily focus sessions; 391 during the six week training period and a further 43 subsequently.

6.3.3 Experimental manipulation check

As highlighted in section 3.5 of Chapter 3, there were various levels to the health behaviour change that the intervention was seeking to induce. The first was simply to prompt participants to stop and think for a few minutes each day and note down their plans in a daily focus session. This was the focus of the manipulation checks for Studies 2 and 3 and had the advantage that it could be measured simply and objectively, as demonstrated in Table 6.4 above. More sophisticated assessment of behaviour change, e.g., regarding the extent to which participants applied the various SI, PI and TI activities or the extent to which they carried through their plans into their everyday lives, should be possible with the method of data capture used. However, with the volume of data generated (over 900 writing sessions for Studies 2 and 3, with multiple entries per session), this would require considerable time and resources, and possibly some form of automation to address in a systematic way. Possibilities are discussed in section 9.2.1 of Chapter 9.

6.3.4 Main experimental outcomes

This section addresses the first aim of investigating the nature and timing of any effects of the daily writing sessions. It presents the results of testing hypothesis 1, which was:

Hypothesis 1: That engagement in the training would be associated with positive changes in scores on self-report measures of psychological well-being between baseline and the end of the six week intervention.

To investigate whether there were any significant changes over the course of the intervention, repeated-measures ANOVAs were conducted for seven key outcome variables, measured across the following time points: baseline (T1), one week (T2), three weeks (T3), six weeks (T4). The results, listed in order of significance, are shown in Table 6.5 on the next page.

The mean scores moved in a positive direction for all seven variables. The changes were statistically significant for the first five variables (goal status, anxiety, perceived stress, negative affect and self-efficacy) and close to being significant for the sixth (depression). Applying a Bonferroni correction reduced the significance threshold to .007, according to which just the first three variables might be considered to have shown statistically significant changes. Thus, based on this stricter assessment criteria, hypothesis 1 was supported in respect of goal status/progress, anxiety and perceived stress scores.

Table 6.5 Study 2: Results of repeated-measures ANOVAs for T1-T4 changes in self-report measures of psychological well-being

Variable	T1 mean (SD)	T2 mean (SD)	T3 mean (SD)	T4 mean (SD)	<i>F</i>	<i>df</i>	<i>p</i>
Total GOSS (goal status)	-1.88 (7.02)	3.04 (6.79)	4.00 (6.99)	5.88 (7.26)	14.24	(3, 69)	<.001
HADS anxiety	16.79 (3.77)	15.08 (3.39)	14.79 (4.17)	14.04 (4.32)	6.98	(3, 69)	<.001
Perceived stress	32.96 (6.86)	30.67 (6.45)	28.75 (8.23)	29.38 (7.37)	4.52	(3, 69)	.006
Negative affect	2.42 (0.71)	2.13 (0.79)	2.13 (0.88)	2.01 (0.74)	3.83	(3, 69)	.013 ¹
Self-efficacy	30.33 (3.63)	31.21 (3.56)	31.58 (3.64)	31.83 (4.67)	3.14	(3, 69)	.031
HADS depression	12.46 (3.37)	11.50 (3.20)	11.54 (3.58)	10.96 (2.65)	2.63	(3, 69)	.057 ¹
Positive affect	3.05 (0.78)	3.08 (0.75)	3.25 (0.64)	3.32 (0.81)	1.51	(2.63, 60.48)	.226 ²

¹ Raw means \pm SD shown, but comparisons made on appropriately transformed data.

² As recommended by Field (2013), Huynh-Feldt correction used for significant Mauchly's test of sphericity, as Greenhouse-Geisser estimate of sphericity greater than .75.

As noted in section 6.1.1, a key objective was to investigate the timing of any improvements, as this would inform the design of Study 3. No prediction had been made regarding the rate of change. The specific hypothesis had simply been that at some point (i.e., after one week, three weeks or six weeks), there should be detectable improvements in outcome measures compared to baseline. The repeated-measures ANOVAs had therefore been set up with three planned simple contrasts (i.e., T1 v T2, T1 v T3 and T1 v T4). Data for the three variables below the Bonferroni corrected significance level are set out in Table 6.6 on the next page. Just the T1-T2 and T1-T3 contrasts are shown, as the focus was on establishing the point at which changes became significant.

As the comparisons were planned and divided the ANOVA model into component parts, the convention was followed of not applying any further Bonferroni type adjustment, which would for example have been required in the case of post hoc

comparisons (Tabachnick & Fidell, 2013). As the data stemmed from the seven repeated-measures ANOVAs reported in Table 6.5, the same significance threshold of .007 was applied to the planned comparisons. Thus, in Table 6.6 total GOSS and HADS anxiety had registered statistically significant changes by T2 (end of first week) and all three variables by T3 (end of third week).

Table 6.6 Study 2: Planned contrasts for outcome variables with significant Bonferroni corrected T1-T4 changes

Variable	T2 v T1				T3 v T1			
	<i>F</i>	<i>df</i>	<i>p</i>	Effect ¹	<i>F</i>	<i>df</i>	<i>p</i>	Effect ¹
Total GOSS (goal status)	13.85	1, 23	.001	0.71	18.52	1, 23	<.001	0.84
HADS anxiety	13.32	1, 23	.001	0.48	10.72	1, 23	.003	0.50
Perceived stress	4.50	1, 23	.045	0.34	11.32	1, 23	.003	0.56

¹ Effect size calculated using Cohen's *d*, i.e., difference between means divided by pooled SD. See discussion section 6.4 for alternatives.

Table 6.6 also shows effect sizes. As highlighted by Lakens (2013), there are many different ways of calculating effect sizes. For ease of comparison the most commonly cited, Cohen's *d*, is shown. According to Cohen's (1988, 1992) simple rule of thumb of 0.2 (small), 0.5 (medium) and 0.8 (large), the total GOSS changes could be considered large and the anxiety and perceived stress changes, medium effects. However, this is addressed in more detail in section 6.4.1.

As noted in section 6.3.2, it was also possible to conduct intention-to-treat as well as per-protocol analyses, as the seven participants who withdrew between T1 and T2 all completed exit questionnaires. As there were just two time points, paired-samples *t*-tests were used. The *p* values generated would have been the same, had a repeated-measures ANOVA *F* test been applied. Thus, the *p* values were comparable to those shown in Table 6.5. A difference, however, is that as SPSS offers a bootstrapping option with paired-samples *t*-tests, bias corrected and accelerated bootstrap 95% confidence intervals are shown in Table 6.7 on the next page. The results are again listed in order of statistical significance.

As might have been expected, the improvement trend was weaker than for the per-protocol analyses. Only the HADS anxiety reduction could be regarded as having reached conventional statistical significance, as its *p* value was just on the margin and the bootstrap 95% confidence intervals did not cross zero. Applying the more stringent

Bonferroni corrected significance threshold of .007, none of the changes were statistically significant.

Table 6.7 Study 2: Intention-to-treat analyses of T1-T2 outcome changes

Variable	T1 mean (SD)	T2 mean (SD)	<i>t</i>	<i>df</i>	<i>p</i>	BCa 95% CI for mean difference
HADS anxiety	16.58 (3.72)	15.52 (3.60)	2.04	30	.051	0.16, 2.00
Total GOSS (goal status)	-0.52 (7.34)	2.19 (7.29)	1.95	30	.061	-5.77, 0.08
Self-efficacy	30.94 (3.61)	31.45 (3.24)	-1.38	30	.177	-1.19, 0.16
Negative affect	2.37 (0.64)	2.26 (0.81)	1.08	30	.290	-0.05, 0.15 ¹
HADS depression	12.03 (3.28)	11.71 (3.50)	0.83	30	.412	-0.02, 0.05 ¹
Perceived stress	32.29 (6.27)	31.42 (6.58)	0.83	30	.413	-1.05, 2.82
Positive affect	3.16 (0.74)	3.06 (0.80)	0.62	30	.542	-0.22, 0.42

¹ Raw means ± SD shown, but comparisons made on appropriately transformed data.

Table 6.8 on the next page provides insights into the source of the weakened impact, by showing the change scores for the seven participants who withdrew between T1 and T2. Not only did their mean scores fail to improve, they in fact deteriorated across all seven variables. The change in only one variable, HADS depression, was significant using conventional *p* values (i.e., < .05), but according to the bias corrected and accelerated bootstrap 95% confidence intervals, six out of seven could be interpreted as representing genuine population effects. Though this subsample was very small (*N* = 7) and none of the changes were significant according to the more stringent .007 threshold applied above, the data highlight the possibility of adverse effects where participants and interventions are not appropriately matched. This is discussed in section 6.4.2.3.

As Study 2 was exploratory, possible changes were also investigated for five further outcome variables measured at T1 and T4. They are shown (in order of statistical significance) in Table 6.9. As adding these additional five variables increased the total number of T1-T4 comparisons to twelve variables, a Bonferroni correction for twelve tests was applied. This reduced the significance threshold to .004, according to which W-BNS competence and relatedness were deemed to have shown significant improvements. The Cohen's *d* effect sizes were 0.50 and 0.36, respectively.

Table 6.8 Study 2: T1-T2 outcome changes for participants withdrawing

Variable	T1 mean (SD)	T2 mean (SD)	<i>t</i>	<i>df</i>	<i>p</i>	BCa 95% CI for mean difference
HADS depression	10.57 (2.82)	12.43 (4.58)	-2.70	6	.035	-0.10, -0.02 ¹
Perceived stress	30.00 (2.94)	34.00 (6.86)	-2.01	6	.091	-7.71, -0.43
Total GOSS (goal status)	4.14 (6.91)	-0.71 (8.71)	1.76	6	.128	0.36, 9.29
Negative affect	2.21 (0.27)	2.74 (0.74)	-1.70	6	.140	-0.33, -0.01 ¹
Positive affect	3.52 (0.46)	2.98 (1.00)	1.66	6	.149	0.02, 1.19
Self-efficacy	33.00 (2.83)	32.29 (1.70)	1.18	6	.283	0.00, 1.57
HADS anxiety	15.86 (3.76)	17.00 (4.20)	-0.79	6	.462	-3.00, 1.29

¹ Raw means \pm SD shown, but comparisons made on appropriately transformed data.

Table 6.9 Study 2: T1-T4 outcome changes for additional self-report measures

Variable	T1 mean (SD)	T4 mean (SD)	<i>t</i>	<i>df</i>	<i>p</i>	BCa 95% CI for mean difference
W-BNS competence	22.79 (5.45)	25.46 (5.20)	-3.83	23	.001	-0.36, -0.12 ¹
W-BNS relatedness	17.21 (5.58)	19.29 (6.02)	-3.30	23	.003	-3.29, -0.83
Optimism	16.13 (6.00)	17.04 (5.66)	-1.39	23	.179	-2.29, 0.46
HINT (habit index)	44.67 (13.99)	43.25 (9.29)	0.60	23	.554	-3.97, 5.79
W-BNS autonomy	17.13 (4.70)	17.54 (4.79)	-0.54	23	.579	-1.88, 1.00

¹ Raw means \pm SD shown, but comparisons made on appropriately transformed data.

6.3.5 Factors predicting or influencing experimental outcomes

This section presents the results of testing hypotheses 2 and 3. Hypothesis 2 was:

Hypothesis 2: That greater engagement (measured in terms of the number of completed writing sessions) would be associated with greater improvements in scores on self-report measures of psychological well-being.

A Pearson product moment correlation matrix was produced, comparing the number of writing sessions with Time 1 to Time 4 change scores (i.e., baseline to 6 weeks) for the eight outcome measures of self-reported psychological well-being that had shown significant improvements at the conventional threshold of $\alpha = 0.05$ (two-tailed). These were: total GOSS, HADS anxiety, HADS depression, perceived stress, self-efficacy, negative affect, W-BNS competence and W-BNS relatedness.

Only self-efficacy change appeared to be significantly correlated with the number of writing sessions, $r = .45$, 95% BCa CI [.24, .70], $p = .026$. As the BCa 95% confidence intervals did not cross zero, this would suggest there could be a genuine relationship between the two variables in the population from which the sample was derived. Thus, the greater the number of writing sessions, the greater the improvement in self-efficacy. For the other variables, though the direction of the correlations was as predicted (i.e., more sessions, greater improvements), none were close to significance. The next lowest p value was for the correlation with HADS depression change, $r = -.31$, 95% BCa CI [-.69, .18], $p = .145$.

If a Bonferroni correction were applied to take account of the eight comparisons made, the significance threshold would be reduced to .006, in which case none of the correlations would be considered statistically significant. However, section 6.4.2.1 highlights a number of risks associated with stringent use of Bonferroni corrections.

Hypothesis 3 was:

Hypothesis 3: That participant engagement (measured in terms of completed writing sessions) would be associated with the following baseline (Time 1) measures:

- **Person factors:** Self-efficacy, outcome expectations, consideration of future consequences, big five personality factors, participant age, and REI-type 1 and 2 cognitive processing.
- **Environment (sociostructural) factors:** Job-role autonomy, management support, tangible social support, and recent environmental change.

Within the person factors grouping, two of the TIPI personality traits (agreeableness and emotional stability) were excluded due to poor internal reliability, as shown in Appendix D12. Outcome expectations regarding the training were addressed by question 6 in the final section of the training guidance notes (Appendix D5), which asked participants to indicate the extent to which they thought the training could help them. The four options given (1. *I don't think this training can help me*; 2. *I am unsure whether training can help me*; 3. *I think this training can perhaps help me*; 4. *I think this training can definitely help me*.) produced a normal distribution of scores.

A Pearson product moment correlation matrix was generated for all the person-related variables. Table 6.10 below shows correlations between the variables and the number of writing sessions that could be regarded as statistically significant. A further variable 'conscientiousness' was also close to significance, $r = .32$, 95% BCa CI $[-.03, .57]$, $p = .073$. The p values for the remaining T1 variables were: age (.174), extraversion (.254), self-efficacy (.667), REI-type 2 (.820) and openness to experience (.850).

Table 6.10 Study 2: Correlation coefficients for associations between number of writing sessions and T1 person-related variables

	Variable	1	2	3	4
1	Writing sessions ¹	-----			
2	Outcome expectations (perceived helpfulness)	.37* [.03, .63]	-----		
3	CFC ¹	.34 ^{ns} [.03, .59]	.07 ^{ns} [-.29, .44]	-----	
4	REI-type 1 ¹	.34* [-.04, .65]	-.02 ^{ns} [-.35, .34]	.11 ^{ns} [-.28, .44]	-----

^{ns} = not significant (2-tailed), * = $p < .05$. BCa bootstrap 95% CIs reported in brackets.

¹ Correlations based on appropriately transformed data.

Although the correlation between CFC and writing sessions was not quite statistically significant, $r = .34$, 95% BCa CI $[-.03, .59]$, $p = .056$, as the bootstrapped confidence intervals did not cross zero, this supported the likelihood of a genuine relationship.

With the relatively small sample ($N = 33$) and even less for some of the predictors (e.g., outcome expectations, $N = 29$), it was not feasible to carry out meaningful multiple regression analyses. Tabachnick & Fidell (2013), for example, cite a minimum sample size of $N \geq 50 + 8m$ to be able to detect medium-sized effects (where m = number of IVs; $\alpha = .05$; $\beta = .20$).

Within the environment-sociostructural factors grouping of possible predictor variables, job-role autonomy was addressed with two variables, Time 1 W-BNS autonomy and an

alternative, single item question (no. 17) from questionnaire 1 (Appendix D4), 'How much flexibility/choice do you have in the timing, order or way in which you carry out your work tasks?' Management support was addressed by question 22 from the same questionnaire, i.e., 'At work, how approachable / open-minded / open to discussion of your ideas and suggestions, do you consider your line manager / supervisor?'

Tangible social support was measured using the appropriate ISEL subscale. Recent environmental change was addressed by two questions: 20. 'Approximately how long have you been working in your present job role or function? (i.e., how long since the last major change in the location, nature, content or organisation of your work?); and 21. 'Approximately how long is it since there was a major change in your routine / pattern of living outside work (e.g., change of where you live or who you live with, etc.)?' None of these variables was significantly or even close to being significantly correlated with the number of writing sessions.

6.3.6 Long-term sustainability of writing activities and their effects

This section addresses hypothesis 4, which was:

Hypothesis 4: That if participants continued their writing activities over the course the year, any improvements in scores on self-report measures of psychological well-being would be maintained. Conversely, if the writing activities were not continued, the prediction was that any improvements in scores would not be maintained.

At the end of the study, participants were offered the option of continuing their daily focus sessions on a replica webpage. Of the 24 who completed the training and the T4 questionnaire, 14 indicated that they would be interested in continuing. However, only six subsequently continued and their usage ranged from one to 20 further sessions. Consequently, there was no long-term continuation and it was therefore expected that the T1 to T4 improvements would not be maintained. This was tested by comparing T5 scores to T1 scores for the variables that had shown significant or close to significant improvements in section 6.3.4 above. The results for the subsequent paired-samples t-tests are shown in Table 6.11 on the next page. The table also includes T4 mean scores (in italics) for comparison.

Table 6.11 Study 2: T1-T5 paired-samples t-tests for key outcome variables

Variable	T1 mean (SD)	T4 mean (SD)	T5 mean (SD)	<i>t</i>	<i>df</i>	<i>p</i>	Effect size (<i>d</i>)	BCa 95% CI for mean difference
Total GOSS (goal status)	-2.38 (6.47)	5.48 (7.43)	6.67 (7.55)	-5.26	20	<.001	1.29	-12.27, -5.91
HADS anxiety	16.76 (3.46)	14.24 (4.31)	13.38 (3.84)	4.32	20	<.001	0.93	2.19, 4.62
Self-efficacy	30.48 (3.25)	32.00 (4.28)	33.10 (4.16)	-4.21	20	<.001	0.70	-3.86, -1.38
W-BNS relatedness	17.14 (5.45)	19.00 (5.98)	21.86 (5.53)	-3.63	20	.002	0.86	-7.38, 2.33
HADS depression	12.33 (3.10)	10.95 (2.71)	9.76 (2.77)	3.35	20	.003	0.87	0.05, 0.16 ¹
Negative affect	2.37 (0.60)	2.00 (0.79)	1.90 (0.80)	3.44	20	.003	0.66	0.08, 0.28 ¹
Perceived stress	33.24 (6.19)	29.67 (7.31)	28.71 (6.79)	3.10	20	.006	0.70	1.76, 7.14
W-BNS competence	23.38 (5.44)	26.05 (4.35)	25.91 (5.20)	-2.98	20	.007	0.48	-0.41, -0.11

¹ Raw means \pm SD shown, but comparisons made on appropriately transformed data.

As eight comparisons were made, the Bonferroni corrected significance threshold was reduced to .006, according to which seven out of the eight variables showed significant T1-T5 differences. As the improvements in the well-being scores had been maintained in the absence of continued online writing sessions, hypothesis 4 was therefore not supported. Inclusion of the T4 means shows that the scores further improved for seven out of the eight variables between T4 and T5, but the changes were not statistically significant.

6.3.7 Qualitative feedback

There were two sources of qualitative feedback: the open questions in the online surveys and participants' online writing sessions. The writing sessions provided insights into how participants had interpreted and applied the SI, PI and TI techniques and any problems encountered. Chapter 7 (section 7.3.2) illustrates how such insights were used to try to further enhance the effectiveness of the intervention. The questionnaire feedback also proved useful in providing insights into some of the quantitative findings, an example of which is provided in the discussion section below.

6.4 Discussion

6.4.1 Summary of key findings

The following four hypotheses were tested:

Hypothesis 1 predicted that engagement in the training would be associated with positive changes in scores on self-report measures of psychological well-being between baseline and the end of the six week intervention. This was supported on a per-protocol basis in the case of goal status, anxiety, perceived stress, work-based competence and work-based relatedness, using a stringent Bonferroni corrected significance threshold. Applying a conventional significance threshold, improvements were statistically significant for two further variables, negative affect and self-efficacy. An intention-to-treat analysis covering the first week of training (T1 to T2) showed a weaker overall impact. This was accounted for by deteriorations in the psychological well-being scores of seven participants who withdrew from the training.

Hypothesis 2 predicted that greater engagement (measured in terms of the number of completed writing sessions) would be associated with greater improvements in scores on the self-report measures of psychological well-being addressed in hypothesis 1. The hypothesis was supported for only one of the eight variables assessed, namely self-efficacy. Whether this could be considered statistically significant depends on the convention used for correcting for the possibility of Type I errors (see section 6.4.2.1).

Hypothesis 3 predicted that participant engagement (completed writing sessions) would be associated with a range of person- and environment-related factors, either based on theory or the findings of Study 1. The hypothesis was not supported for any of the environment-related factors, but was supported for three person-related factors: outcome expectations, consideration of future consequences and type 1 cognitive processing. The latter two, however, were borderline, i.e., just on the limit of the conventional statistical significance threshold.

Hypothesis 4 predicted that improvements in scores on self-report measures of psychological well-being (relating to hypothesis 1) would be maintained, if participants continued their writing activities over the course the year. Improvements were maintained for the following variables: goal status, anxiety, self-efficacy, work-based relatedness, depression, negative affect and perceived stress. However, this was achieved without any long-term continued online practice.

6.4.2 Implications

Possible implications are discussed below with respect to (i) the overall research process, (ii) the relative effectiveness of the intervention, and (iii) issues raised by the study findings.

6.4.2.1 Research process (*piloting and evaluation*)

The primary purpose of Study 2 was to test the feasibility of the revised goal-momentum self-regulatory writing intervention as a potential research tool. In section 4.5.2.5 of Chapter 4, it was noted that the intervention used in Study 1 appeared too complex for optimal recruitment and retention. With Study 2, although there were some initial difficulties with recruitment, particularly recruiting enough male participants, the intervention itself appeared to be manageable for most participants, with 24 out of the 31 (77%) who started, completing the six week training programme (including all four questionnaires).

As demonstrated by the support for hypotheses 1 and 4, the intervention also appeared to deliver the type of improvements that it had been designed to generate, i.e., better progress towards goals and positive changes in a range of measures of psychological well-being. Furthermore, the fact that this was achieved by participants following written instructions, without any direct interaction with a trainer or group participation, augurs well for ease of replication and experimental control in subsequent studies. The rapidity of the changes (i.e., statistically significant within one to two weeks) also suggested that shorter, less demanding interventions might be feasible, which could facilitate recruitment and retention in subsequent studies.

The broad variation in the number of writing sessions completed by participants illustrated that engagement in such behaviour change initiatives is unlikely to be an all-or-nothing issue. This reinforces the value of online capture of writing sessions as a means of objectively measuring degrees of engagement.

A further key research process issue concerns the analysis and interpretation of findings. The results section followed the convention of applying Bonferroni corrections to reduce the risk of Type I errors. However, this reporting convention raises numerous problems. As highlighted by Moran (2003), such corrections increase the risk of Type II errors and only address the p values of individual tests, ignoring how many reach significance. There are also no discernible limits to the correction, i.e., whether it should apply to a particular table of tests or encompass a whole chapter of results. As highlighted by Nakagawa (2004), this can contribute to publication bias by discouraging researchers from reporting detailed multiple analyses and non-significant results. For example, had the results been weaker for Study 2, there could have been temptation to

limit the number of comparisons reported to retain some statistically significant results after Bonferroni corrections, particularly if seeking publication in journals applying strict cut-off limits for statistical significance. This, however, could potentially hinder the advance of knowledge, as non-significant results can raise useful questions, as illustrated in section 6.4.2.3 below. They can also contribute to more significant findings when combined with the results of other studies in meta-analytic reviews. This thesis, therefore, adheres to the approach, advocated by Nakagawa (2004), of conducting and reporting as many relevant analyses as possible within the space constraints, rather than trying to protect p values. The latter arguably has no scientific merit, given that $\alpha = .05$ is an arbitrary threshold and that the post-positivist paradigm, which perhaps best represents this research, is not generally amenable to simple, categorical, ‘all-or-nothing’ judgements. Furthermore, if multiple testing does occasionally generate some spurious results, this can be remedied with subsequent replication.

6.4.2.2 Relative effectiveness of the extended writing paradigm

As explained in Chapter 2, a key aim of this thesis was to extend Pennebaker’s experimental writing paradigm to try to research and develop more powerful and comprehensive forms of self-regulatory skills training. Though one might not expect the self-administered intervention described in this chapter to be as effective as some of the better resourced, expert-led, face-to-face interventions cited in Chapter 2, it should at least be an improvement on Pennebaker’s basic emotional disclosure format, if it is to offer a viable avenue for extending self-regulatory research.

Table 6.12 below summarises the results for one of the main outcome variables for Study 2 that was also addressed in some of the meta-analytic studies discussed in Chapter 2. As meta-analyses often use different calculations, the table presents various alternatives for ease of comparison.

Table 6.12 Study 2: Effect sizes for changes in perceived stress scores

Time period	Cohen’s d	Hedge’s g	Pearson’s r
T1 – T2 (n = 24)	0.34	0.34	0.17
T1 – T3 (n = 24)	0.56	0.55	0.27
T1 – T4 (n = 24)	0.50	0.50	0.24
T1 – T5 (n = 21)	0.70	0.68	0.33

Frattaroli’s (2006) meta-analysis of experiments using Pennebaker’s emotional disclosure writing paradigm reported an overall mean unweighted effect for psychological outcomes across 112 studies of $r = .056$, 95% CI [.026, .086], $p = .00014$. Taking perceived stress as an example, for 45 studies using the same PSS scale as in Table 6.12 above, the mean unweighted effect size was $r = .029$, 95% CI

$[-.020, .078]$, $p = .12$. This does not even constitute a small effect, according to Cohen's (1988, 1992) effect size guidelines of small ($r = .10$), medium ($r = .30$) and large ($r = .50$). In contrast, the results for perceived stress in Study 2 constitute small to medium effects. Even more encouragingly, the effects for Study 2 were still evident after twelve months, whereas Frattaroli's (2006) review found that the effects for emotional disclosure interventions appeared to decline after just one month.

Study 2 also appears to compare favourably to some of the more resource intensive stress-management interventions cited in Chapter 2. A review of the impact of psychoeducational stress-reduction interventions on perceived stress, by Van Daele et al. (2012), reported an average treatment effect size (Hedge's g) of .27, 95% CI [.14, .40] posttest and .20, 95% CI $[-.04, .43]$ at follow-up, a mean of 5.56 months post-intervention. As Hedge's g is a bias corrected version of Cohen's d , the relevant guidelines are small ($d = .20$), medium ($d = .50$) and large ($d = .80$), according to which these might be considered small effects, whereas the results for Study 2 are closer to medium effects.

An important caveat, however, is that these are not like-with-like comparisons. The effect sizes in the meta-analyses cited in Chapter 2 were between-group comparisons based on controlled experiments, whereas the Study 2 effect sizes were within-group comparisons based on non-controlled experimentation. The most important consequence of this, as discussed in the limitations section, is that one cannot assume that the Study 2 effects necessarily stemmed from the intervention. A secondary issue is how best to compare between-participant and within-participant effects. As highlighted by Morris & DeShon (2002), within-participant designs are subject to less error variance due to individual differences and hence should be more sensitive to any treatment effects. Applying their Cohen's d equation for repeated measures (equation 8, p. 109), which takes into account the relationship between means in repeated-measures tests, would show even higher effect sizes than those shown in Table 6.12. However, the main caveat still applies in that the true source of such effects is uncertain.

6.4.2.3 Questions raised

Despite the uncertainty stemming from the experimental design, the results raised a number of key questions, briefly discussed below.

Hypothesis 1: Though the outcome measures that showed statistically significant improvements were the main focus, the measures that failed to reach statistical significance (e.g., positive affect, W-BNS autonomy, optimism, HINT) were also of interest, as they raise questions about the relative sensitivity of these measures. They

also highlight possible areas for improving the intervention and this is illustrated in the case of W-BNS autonomy, HINT and optimism in Chapter 7.

A further key finding was the deterioration in scores of the seven participants who withdrew. There are various possible explanations. This could, for example, have stemmed from a sense of disappointment or failure associated with withdrawing, or it could have stemmed from the intervention itself, e.g., due to possible incompatibilities between the participants and the techniques used. The finding highlights the importance of investigating possible predictors of successful engagement, to ensure that ultimately the right types of interventions are offered to the appropriate people.

Hypothesis 2: If self-efficacy was genuinely the variable for which changes were best predicted by the number of writing sessions, this could be taken as support for SCT and for personal mastery or accomplishment being a key source of self-efficacy. However, with just one moderately significant correlation amongst eight comparisons drawn, it is possible that this was just a spurious result. This was therefore subsequently further investigated in Study 3.

Hypothesis 3: Three person-related factors (outcome expectations, consideration of future consequences and type 1 cognitive processing) were found to predict the number of writing sessions. The result for outcome expectations supported the SCT model. It also had important implications for the choice of control condition in any controlled experimentation. This is discussed in Chapter 7. The result for consideration of future consequences similarly supported the dual-process goal-momentum model, in that the more future oriented the individual, the greater the engagement in the writing activities. This is also addressed in Chapter 7.

The result for type 1 cognitive processing (faith in intuition), however, was not in the direction expected, as it was positively correlated ($r = .34$) with the number of writing sessions. This could have been a chance result or possibly signalled a limitation of the scale. For example, four out of the five items in the scale referred to trusting one's hunches or gut feelings about people (see Appendix B16). However, as highlighted by Evans (2008), type I cognitive processes involve more than just making snap decisions about people. Also, as highlighted by Fiske & Taylor (1991) with the distinction between 'motivated tactician' and 'cognitive miser', different types of judgements might apply in different situations.

No evidence was found of a possible relationship between writing sessions and environmental factors. This may have been due to the relatively simple measures used. An alternative explanation is that as the writing sessions constituted a personal, private activity, personal factors may be better predictors than environmental factors. The

latter, however, could perhaps play a greater role in the longer term sustainability, e.g., by influencing the likely responses to participants' stress-reduction initiatives.

Hypothesis 4: Given that some of the meta-analyses cited in Chapter 2 highlighted a tendency for the effects of interventions to fade over time, it was encouraging to see that the improvements observed in Study 2 were maintained a full year later. This should not perhaps have been surprising, since the intervention had been specifically designed to create a habitual practice to prevent any such fading. What was unexpected was that the improvements appeared to have been sustained in the absence of continued writing sessions. Possible insights, however, are provided by participants' answers to question 79 in the 12-month follow-up questionnaire (Appendix D11). It asked if they now did anything differently to cope with stress, compared to before having participated in the study. Three possible sources of explanation emerged (illustrated by the participant quotes beneath each heading):

1. Fundamental psychological change/breakthrough

I now accept myself better for who I am, value myself higher. Am able to make clearer more structured decisions and notice my emotions better before they take control.

[P127]

Believe in myself and have confidence in what I do. [P105]

2. Intermittent continued use of writing sessions when needed

At times when I feel I am starting to lose the plot I go back to the Daily Focus exercises and that helps me to re-orientate myself for the next period. [P112]

When pressure builds up I take time to stop and evaluate the situation, list actions and prioritise. I also ensure that I take time to do things for me including prioritising exercise sessions. [P126]

These were possibly underpinned by a third factor related to the process of learning.

3. Sufficient reinforcement within initial training period

The repeated daily sessions had a beneficial impact because they were repeated and had a chance to sink in, rather than just a session that you do once then tend to forget about. [P109]

This might suggest that the daily writing sessions do not need to be continued indefinitely to maintain improvements, but simply long enough to achieve a certain threshold of change or depth of learning. If so, the question then becomes how long to reach such a threshold. Again, this is something that can be explored in further studies and was addressed in Study 3.

6.4.3 Limitations

The key limitation stemmed from the study design, which, as highlighted by Harris et al. (2006), posed numerous threats to internal validity, i.e., the extent to which the changes observed could be presumed to have been caused by the intervention. The threats were alternative sources of explanation and, for example, included:

- History – that changes may have been caused by parallel events, e.g., national excitement associated with the 2012 summer Olympics. Though this would not have accounted for the T5 results a year later.
- Maturation – though more usually associated with children, it is possible that improvements might have occurred naturally anyway.
- Regression to the mean – that participants may have volunteered at a particularly low point in their lives and subsequently reverted to a more balanced position.
- Repeated testing effects – this is usually associated with IQ testing, but repeated exposure to the same questionnaire items could have conditioned or primed participants in some way. (It is important to note, however, that participants had no record of their responses to each questionnaire.) There was also the possibility of some form of ‘response shift’, e.g., through changes in the way respondents appraised their situations, although this is more usually associated with quality of life and adapting to illness or disability (e.g., Schwartz, Andresen, Nosek, & Krahn, 2007).

A key limitation in terms of external validity, and more particularly population validity, was that no generalization could be offered regarding effects on men, with so few in the sample.

6.5 Conclusion

As highlighted in the previous section, there were clearly limitations to the study, particularly in terms of being able to make causal inferences. However, the primary aim had been to test the feasibility and potential effectiveness of the online intervention. The results were encouraging and demonstrated the viability of using the intervention as part of the randomised controlled trial planned for Study 3. It was envisaged that the more rigorous design for Study 3 would address many of the threats to internal validity outlined above. The study is described in Chapter 8. The next chapter describes further refinements made to the intervention and explains the rationale for the design of the control condition for Study 3.

CHAPTER 7: REVISIONS TO ONLINE INTERVENTION AND DESIGN OF CONTROL CONDITION

7.1 Introduction

As the intervention designed for Study 2 resulted in significant improvements across a range of outcome measures, no major changes were considered necessary for Study 3. However, a number of minor adjustments were made at various process levels to try to further enhance the intervention. This chapter briefly reviews each level and the key changes made.

7.2 Stress-reduction process

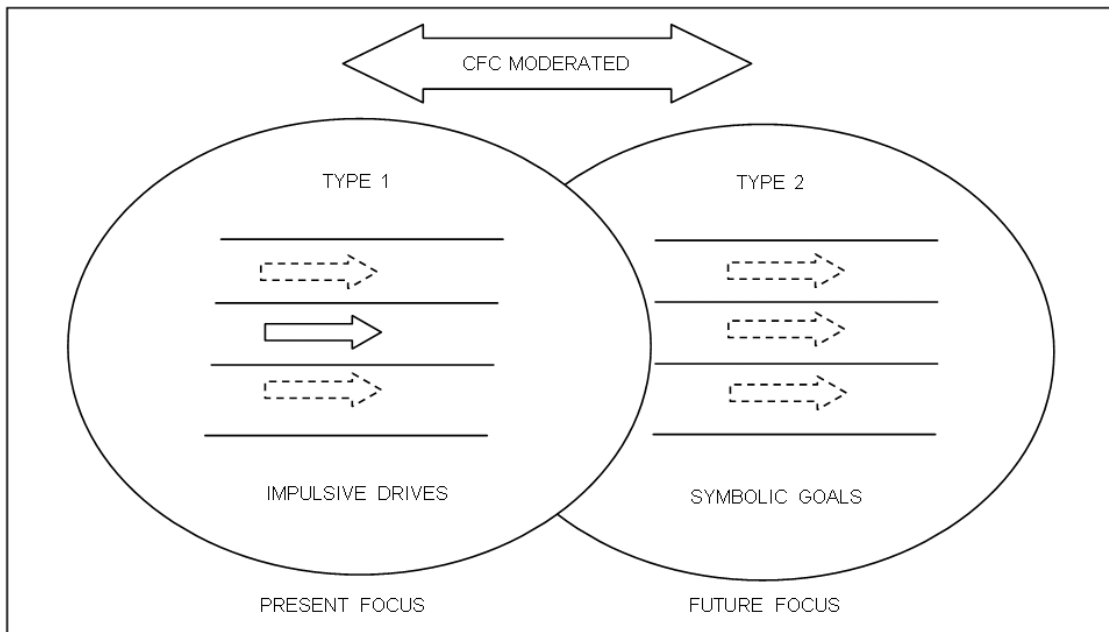
The improved scores on self-report measures of psychological well-being, observed in Study 2, were consistent with the basic goal-momentum model (section 3.3.3), upon which the intervention was based. Thus, greater progress towards goals was associated with increased positive affect, reduced negative affect and reduced stress. It was also associated with positive changes in variables closely related to a sense of personal control (i.e., self-efficacy, depression and anxiety), as can be explained by Bandura's (1986) social cognitive theory and Walker's (2001) unified theory of control. Within the basic goal-momentum model, a greater sense of control can be viewed as an enhanced personal resource, represented by the size of the oval within the goal arrow (see Figure 3.7, section 3.3.3). As the goal progress efforts were principally work focused, the associated improvements in work-related competence and relatedness were also consistent with the goal-momentum model.

Clearly, not all the scores for the various measures improved to the same extent. The increases in positive affect, for example, were not statistically significant. A possible explanation for the weaker performance compared to negative affect is offered by Herzberg's (1966) motivation-hygiene theory, which posits different routes for reducing negative affect and increasing positive affect. According to the theory, tackling sources of negative affect in the working environment could shift someone from a negative to a neutral emotional state, but not positive, as the latter depends on fulfilling more intrinsic needs, such as finding stimulation or meaning in one's work. If the theory is correct, achieving significant improvements in positive affect might, for example, require a greater focus on the SI component of the intervention to find more appropriate goals to pursue. Other variables that failed to register statistically significant improvements (i.e., autonomy, HINT and optimism) are addressed in section 7.3 below.

As explained in Chapter 5, the intervention in Study 2 was based on a revised dual-process version of the goal-momentum model. The intervention was therefore

designed to address self-regulation of not just type 2 processes, but also type 1 processes. The intervention did not measure the extent to which participants were able to improve their regulation of these two types of processes. It did, however, attempt to assess the extent to which prioritisation of type 1 versus type 2 goal pursuits, measured by the CFC scale, predicted engagement in the intervention and the results appeared to support the model shown in Figure 7.1 below. The CFC scale was therefore retained for Study 3 to see if this finding could be replicated.

Figure 7.1 Dual-process goal-momentum model (CFC moderated)



The model was not supported, however, in terms of engagement being predicted by participants' preference for type 1 or type 2 cognition. Though, as noted in Chapter 6, this may have been due to limitations of the REI scales used. For this reason, the scales were omitted from Study 3.

7.3 Enhancing stress-reduction process

7.3.1 Strategic intelligence

As explained in section 5.3.1, the focus of the intervention in Study 2 was principally work-related. It was therefore anticipated that if participants successfully applied the techniques, their scores would improve on the various elements of the work-based needs scale (W-BNS) included in the study. However, as noted in the previous section, this proved to be the case for the W-BNS competence and relatedness subscales, but not the autonomy subscale. The score for the latter increased slightly from T1 to T4 (initial six weeks), but was far from statistically significant, $t(23) = -0.54$, 95% BCa CI $[-1.88, 1.00]$, $p = .597$ and was still far from significant at the 12-month follow-up, $t(20) = -0.99$, 95% BCa CI $[-3.33, 0.91]$, $p = .334$.

Autonomy and control are complex issues. Self-determination theory (SDT; Deci & Ryan, 2000), upon which the W-BNS scale is based, asserts that individuals are naturally inclined to engage in behaviours that are perceived as self-chosen and congruent with their personal beliefs and values. The six items in the W-BNS autonomy subscale (see Appendix B11) address the extent to which respondents' conduct at work is self-chosen as opposed to imposed by others. Inevitably, there are limitations to any individual's scope for control. However, as highlighted by Langer (1983), perceptions of control depend on one's frame of reference. Consequently, to try to generate greater improvement on the autonomy subscale, parts of the strategic intelligence section of the training guidance notes (Appendix E11) were rewritten for Study 3 to try to broaden participants' frame of reference. The key changes are listed below:

1. The revised instructions focused on the three core SDT needs, but described them in relatively broad terms, leaving participants ample scope for how they chose to implement them.
2. Illustrations of meeting the core needs emphasized simple behaviours perceived to be within the control of most people.
3. The instructions also encouraged participants to:
 - (i) shift their frame of reference from what they could not control to what they could control;
 - (ii) take a longer term strategic perspective, which offered more options for control;
 - (iii) try to adopt a more 'rational', as opposed to 'impulsive', approach to their goal pursuits.

7.3.2 Perceptual intelligence

Chapter 5, section 5.3.2 highlighted various aspects of the intervention in Study 2 that were designed to encourage the development and application of critical self-awareness. These included use of metaphors highlighting different aspects of self (i.e., child/impulsive; adult/rational; robot/habitual) and emphasis on 'balanced/flexible thinking'. In applying perceptual intelligence, participants were instructed to identify the relevant goal state triggering any particular emotion, distinguish between facts and assumptions, challenge possible perceptual biases to achieve a more balanced appraisal, and then decide what constructive action to take.

The daily focus (PI section) entries showed that many participants were able to reappraise their situations and react in more constructive ways as instructed. For example:

Feeling v sad about a friendship that has broken. I am assuming that this is the end of the friendship. The facts are that I have not seen the person for a long time, there must be elements going on for her that I am not aware of. I have lots of really supportive and caring friends. The most rational assessment I can make is: I have a lot of good friends, its inevitable that I will feel vulnerable at the moment, but, all I can do is step by step work through what needs to be done, calmly and gently and not expect too much of myself. [P101 – PI Question 5]

Feeling frustrated and angry. Sent several emails to X with negative outcome - getting brusque response, [...] mail ignored, no word of thanks from [a particular department]. Assumptions. X is inconsiderate, rude and arrogant = my emotional reaction. Facts. X is very busy with a lot of responsibility. [...] Balanced interpretation. He has his strengths and weaknesses and I must not jump to conclusions about his behaviour. I am giving him a lot of space and not interrupting him unless necessary. [P110 – PI Question 5]

Others, however, simply stated their problems, without any appraisal or plans for constructive action. For example:

Problems with PC compounded delays in getting urgent tasks completed, and both are still outstanding. [P135 – PI Question 5]

Not enough time to finish a job hate to depend on people. [P136 – PI Question 5]

To try to encourage a more consistent response with greater self-regulatory processing depth, changes were made to the PI section of the training guidance notes (Appendix E11) and to the appropriate 'More Info' sections of the daily focus webpages (Appendix E13). The changes sought to simplify the instructions by emphasizing three consistent steps, whatever the emotion encountered, i.e., negative, positive or neutral. The steps were labelled:

1. Impulsive reacting
2. Rational thinking
3. Rational acting

Also, to further simplify the instructions, the 'robot/habitual' metaphor was dropped, as few participants had referred to it in their writing sessions and contrasting just one type 1 process against type 2 (i.e., impulsive versus rational) was more parsimonious.

7.3.3 Tactical intelligence

Chapter 5, section 5.3.3 explained the rationale for the following two questions, which had been added to the tactical intelligence section for Study 2: (a) Q9. When is the best time to do them? (optimising task and motivational efficiency) – designed to resist

unhelpful type 1 processes; and (b) Q13. How can you shape your physical and social environment to help you? – designed to make use of helpful type 1 processes.

From the online writing entries, it appeared that participants had understood and were appropriately applying these techniques, as their entries were consistent with the model answers provided in the 'More Info' boxes. However, for question 9, although some participants used the term 'tough investment', none used the term 'positive withdrawals' and so the 'investment – withdrawal' metaphor was omitted from Study 3.

Two further revisions to the tactical intelligence section for Study 3 related to the HINT and 'optimism' variables, which had shown less significant improvements compared to most other measures in Study 2.

The HINT score had decreased slightly from T1 to T4 (initial six weeks), but the difference was far from being statistically significant, $t(23) = 0.60$, 95% BCa CI [-3.97, 5.79], $p = .554$. It was also no more significant at the 12-month follow-up, $t(20) = 0.60$, 95% BCa CI [-4.00, 6.67], $p = .555$. As Study 3 was to include cortisol assessment and cortisol levels have been linked to habitual negative thinking via the perseverative cognition hypothesis (Brosschot et al., 2006), cited in Chapter 3, achieving a greater impact on the HINT was clearly desirable to be able to test this relationship. However, as highlighted by Wood & Neal (2007), habits are formed gradually over time and are not easily extinguished. This could, for example, explain why the intervention in Study 2 appeared to reduce anxiety scores (e.g., through helping participants reduce uncertainty about their ability to achieve desired outcomes), but failed to significantly reduce HINT scores. As the intervention for Study 3 would be shorter than Study 2, this made the likelihood of generating significant improvements even more remote. The aim, therefore, was simply to see if revisions to the intervention could push the HINT changes any closer to significance.

Wood & Neal (2007) highlighted three ways of trying to inhibit or override habitual behaviours:

1. by using effortful self-control;
2. by using automatically activated goals in the form of counter-habitual implementation intentions;
3. by altering exposure to contextual cues triggering the habitual behaviour.

The first was not used due to limitations associated with ego depletion (e.g., Vohs, Baumeister, & Ciarocco, 2005) and difficulties in inhibiting thoughts. The third was not used as worry and rumination could be triggered by a wide range of cues and contexts and thus not easily avoided. The second was therefore the route chosen and involved

adding the instruction that if negative thoughts or worries came to mind, participants should simply note them down and resolve to address them in their next daily focus session. Though just a single instruction, it was envisaged that any impact might be reinforced by the 'serial position effect' (Murdock, 1962) of being positioned at the very end of the TI section.

The rationale for seeking to improve the results for 'optimism' stemmed from its positive associations with greater engagement coping and more generally higher subjective well-being (Carver, Scheier, & Segerstrom, 2010). The optimism score in Study 2 had increased from T1 to T4, but the change was not statistically significant, $t(23) = -1.39$, 95% BCa CI [-2.29, 0.46], $p = .179$. At the 12-month follow-up, it was closer, but still not significant, $t(20) = -1.75$, 95% BCa CI [-2.14, 0.09], $p = .096$.

Although optimism is considered a trait measure and thus relatively stable, Carver et al. (2010) noted that improvement in outcome expectancies in a particular domain can feed through into more generalized optimism scores. Consequently, the end of the TI section (see Appendix E13) was reworded to encourage participants to generate positive outcome expectations on a daily basis (i.e., regarding the implementation of their plans), in the hope that this would eventually feed through into more generalized positive outcome expectancies.

7.4 Motivation/learning/reinforcement process

Section 5.4 of Chapter 5 described elements of the intervention in Study 2 that were designed to facilitate conscious self-regulation of impulsive (type 1), rational (type 2) and habitual (type 1) processes. Insights gained and key modifications for Study 3 are briefly outlined below:

7.4.1 Conscious self-regulation of impulsive self (type 2 addressing type 1)

As already noted in section 7.3.3 above, instructions aimed at regulating impulsive type 1 processes in questions 9 (addressing ego depletion) and 13 (creating environmental prompts to influence one's behaviour) of the TI section, appeared to have been understood and appropriately applied by participants. No changes were therefore made to these elements for Study 3.

7.4.2 Conscious self-regulation of rational self (type 2 addressing type 2)

Elements of the intervention designed to facilitate self-regulation of rational type 2 processes were modelled on social cognitive theory (SCT; Bandura, 1986). Given the importance of self-efficacy in the model, highlighted for example by Armitage & Conner (2000), one might have expected self-efficacy to have been a clear predictor of

engagement in the writing activities. However, of the model components tested in Study 2, only outcome expectations appeared to be a significant predictor. Self-efficacy was far from significant ($p = .667$). This could possibly be explained by the fact that self-efficacy had been assessed using a generalized measure and not one specifically related to the training activities involved. (As noted in section 3.5, self-efficacy could apply to numerous levels of activity.) However, as demonstrated by Carver et al. (2000) in the case of cancer patients, there may be situations in which outcome expectancies are more significant predictors of various health-related outcomes than personal control related constructs such as self-efficacy. Thus, it is possible that the superior predictive ability of outcome expectations over self-efficacy in Study 2 may not have been an artefact of the different ways of measuring the two constructs.

For Study 3, therefore, as the previous study had reinforced the importance of outcome expectations, expected benefits of the training activities were made more prominent. This was done by systematically highlighting expected benefits at the end of each key section of the training guidance notes (see Appendix E11). This applied to both interventions used in Study 3.

7.4.3 Conscious self-regulation of habitual self (type 2 becoming type 1)

As explained in section 5.4.3, the intervention in Study 2 had been designed to try to create a daily self-regulatory writing habit. However, as noted in section 6.3.6, only six of the 24 participants who completed the training continued, with the maximum continuation just twenty further sessions. This is consistent, however, with other research. A study by Lally, van Jaarsveld, Potts, & Wardle (2010) highlighted the wide variation and length of time (18 to 254 days; average 66 days) estimated as necessary for participants to reach a plateau of automaticity in the formation of new habits for relatively simple healthy eating, drinking or exercise behaviours. Furthermore, Verplanken (2006) found that the more complex the behaviour, the lower the degree of automaticity achieved. Thus, given the complexity of the daily focus writing activities compared to the behaviours addressed by Lally et al. (2010), it should not be surprising that a plateau of automaticity was not reached after just 42 days (i.e., six weeks of training). Furthermore, as highlighted by Wood, Quinn, & Kashy (2002), it is questionable whether such activities, drawing on conscious type 2 processing (e.g., for complex appraisal and problem solving), can become truly automatic. Views on this will depend on how type 1 and 2 processes are conceptualized, e.g., as a strict dichotomy or different ends of the same continuum, as discussed in section 5.2.1. However, whatever the ultimate potential for automating type 2 behaviours, as highlighted by Lally & Gardner (2013), it should be feasible to at least make the initiation of such behaviours a target for habit formation.

As Study 3 would be shorter than Study 2, it was considered even less likely to result in sustainable habit formation. However, as discussed in section 6.4.2.3, enduring benefits could still possibly accrue even without the formation of a daily writing habit, e.g., through permanent gains in self-knowledge or intermittent use of the writing techniques when needed. Thus, no major changes were made to the habit formation aspect of the intervention design. There was, however, a minor change involving question 9 in the ‘confirmation of participation’ section of the training guidance notes (Appendices E11 and E9). The wording was slightly modified to try to encourage participants to generate more salient contextual cues for the initiation of the behaviour (i.e., the daily writing sessions).

7.5 Communication/presentation process

No major changes were made to the overall structure of the training materials as described in section 5.5.2. Minor changes involved trying to enhance the consistency of the presentation to reinforce key points. For example, more consistent use of the three PI steps (1. Impulsive reacting; 2. Rational thinking; 3. Rational acting), as described in section 7.3.2 above, and listing benefits at the end of each section of the training guidance notes, as described in section 7.4.2 above.

In contrast to Study 1, there were no reports of participants finding the volume of information or task requirements excessive. However, several participants commented that they regretted not having put more time or effort into the training. A modification was therefore made to Section 3 of the daily focus training guidance notes (Appendix E11) to try to mount a form of ‘inoculation defence’ (McGuire & Papageorgis, 1961). This involved highlighting a likely ‘impulsive’ response and challenging it with a more ‘rational’ response.

Measures were also taken to try to enhance communication effectiveness beyond the intervention itself. For example, as recruitment had been difficult for Study 2, a number of steps recommended by Sue & Ritter (2012) were adopted to try to increase the response rate to recruitment emails. These included:

1. Scheduling emails to avoid days when people were likely to be particularly busy, e.g., Mondays and Fridays. Hence, midweek mornings were selected.
2. Liaising with the management of the host organisation to time emails to avoid potential clashes with other mailings.
3. Sending pre-notification emails. This was deemed to prime participants for the arrival of the main communication and aid in establishing the legitimacy of the communication.

4. Sending a single follow-up reminder one week after the main invitation.

There was just one change in terms of mode of delivery (Webb et al., 2010). A supplementary mode of communication, i.e., Short Messaging Service (SMS) texting was added to try to ensure that participants adhered to the correct sampling times for cortisol assessment. Text messaging has been used in many interventions to help increase adherence to various health-related behaviours (Wei, Hollin, & Kachnowski, 2011). It has also been used specifically to increase adherence to saliva sampling procedures for cortisol assessment (e.g., Oskis, Loveday, Hucklebridge, Thorn, & Clow, 2009).

7.6 Research process

This section summarises key research issues arising from Study 2 and measures taken to address them for Study 3. It is divided into two parts. The first part (section 7.6.1) addresses the two middle phases of the Medical Research Council's guidelines for developing and evaluating complex interventions (MRC, 2000; Craig et al., 2008), i.e., 'feasibility and piloting' and 'evaluation'. See Figure 3.2 in Chapter 3. (N.B. The other two phases are addressed elsewhere: the first phase (development), which is an iterative process, is addressed in Chapters 3, 5 and 7; the fourth (implementation) is addressed in Chapter 9.) The second part of this research process section (i.e., 7.6.2) addresses the design of the control condition for Study 3.

7.6.1 Feasibility, piloting and evaluation

As explained above, this subsection addresses the middle two phases (i.e., second and third) of the MRC guidelines for developing and evaluating complex interventions. Each of the two phases has three components, corresponding to the six headings below. The first three headings address 'feasibility and piloting', the second three, 'evaluation'.

7.6.1.1 Testing procedures

Technically, the procedures appeared to work well, as there were no reports of problems accessing or completing the online activities via the links provided. Also, there were no reports of participants not understanding the instructions, training concepts or activities. The same procedures were therefore maintained for Study 3.

7.6.1.2 Estimating recruitment and retention

Recruiting adequate numbers for Study 2 had proved difficult particularly for men. This may have been partly due to larger numbers of women in many of the departments emailed and partly due to the tendency for men to be less open to help seeking for mental health issues (Möller-Leimkühler, 2002). These factors were unlikely to differ

for Study 3. As the research was not specifically focused on gender differences, the priority, therefore, was simply to boost recruitment in general to increase overall power. The aim was to achieve this by gaining access to larger mailing lists and by improving the emailing procedures (as described in section 7.5 above).

With respect to retention, of the 35 participants who had signed consent forms to participate in Study 2, 24 (68.6 per cent) reached the end of the training programme (i.e., the six week questionnaire). As the Study 3 training spanned less than three weeks, an attrition rate of 30 per cent was considered a reasonable estimate to factor into calculations. (N.B. The attrition rate could possibly have been reduced by simplifying the training. However, attrition and low levels of adherence were useful criteria for exploring individual differences in reactions to the interventions.)

7.6.1.3 *Determining sample size*

This was addressed using G*Power 3.1.5 software (Faul et al., 2007) and is described in section 8.2.2 of Chapter 8.

7.6.1.4 *Assessing effectiveness*

As discussed in section 6.4.2.2, the intervention appeared to generate medium-sized effects, which were still evident after twelve months. However, given the study design, it was possible that other factors beyond the intervention may have contributed to the effects. The next step, therefore, for Study 3 was to introduce a form of control condition to help distinguish the effects of the intervention from other possible sources of influence. The design of the control condition is explained in section 7.6.2 below.

Also, as demonstrated by the incidence of attrition and differing levels of adherence, the intervention evidently did not appeal to everyone. Consequently, for Study 3 it was important to continue to investigate individual differences that might influence engagement in the interventions (see sections 8.1.1 and 8.3.5).

7.6.1.5 *Understanding change process*

The priority for Study 3, as explained above, was to seek stronger evidence that the changes observed stemmed from the intervention itself. Thereafter, trying to understand the intricacies of the change process is extremely challenging, particularly given the complexity of the intervention and multiple BCTs involved. Different participants are likely to draw on different techniques and apply them with differing degrees of sophistication to different goal pursuits in different contexts. Furthermore, when interpreting results, there are not always clear-cut distinctions between ‘process’ and ‘outcome’ measures, as many variables can be considered as both inputs and outputs of complex continual process loops. For example, greater self-efficacy could

lead to greater goal progress and greater goal progress could lead to greater self-efficacy.

This does not mean that it is impossible to understand the change process. It just means that many different approaches are likely to be required to investigate the many processes and sub-processes involved. These approaches, for example, include:

1. Drawing on understanding gained from prior research, e.g., more tightly controlled laboratory experimentation forming the evidence base for established behaviour change techniques, such as implementation intentions discussed in Chapter 3, section 3.4.3.
2. Using mediation analysis, where appropriate, to try to explore possible causal relationships. In complex field experiments this may, for example, involve focusing on clearly delimited sub-processes, where key variables have been identified and their relationships established.
3. Mediation analysis, however, only offers mathematical support for the plausibility of a causal relationship. Experimentation offers far stronger evidence and the multiple component nature of the goal-momentum writing intervention offers many opportunities for experimentation. Some examples of the possibilities have already been outlined above, such as the changes to the TI section to try to improve optimism and HINT outcomes. (N.B. If the purpose of Study 3 had been to focus on just one of these variables and the underlying causal processes, the experiment would have been set up differently. The priority, however, was to seek to optimise the overall strength of the goal-momentum intervention, with multiple BCTs, to better differentiate the effects of the two contrasting self-regulatory coping mechanisms tested.)

7.6.1.6 Assessing cost effectiveness

This was not assessed, as it was and is too early in the research process. However, an advantage of this avenue of research is that online interventions can in principle reach far greater numbers of people at far less cost than expert-led, face-to-face initiatives. It is also relatively inexpensive as a research tool. The intervention in its Study 2 and 3 formats cost no more than conducting a conventional online survey.

7.6.2 Design of control intervention for Study 3

7.6.2.1 Design requirements

The purpose of adding a second condition for Study 3 was to try to control for possible sources of influence beyond the self-regulatory training techniques, such as placebo effects. As highlighted by Hróbjartsson & Gøtzsche (2001), the latter tend to be

associated with small studies involving subjective self-report continuous outcome variables. To control for such an effect, therefore, it was important that the control condition should present participants with a plausible mechanism for reducing stress. The other key requirements were that the core mechanism should be clearly distinguishable from the goal-momentum condition and that in all other respects the interventions should be identical.

7.6.2.2 Key aspects of the control condition content

The mechanism chosen for the control condition was goal-state substitution, as specified in the GSFC taxonomy described in Chapter 3 (Figure 3.4 D). This involves temporarily diverting attention away from a negative affect generating adverse goal state to an instant or relatively instant source of positive affect. In terms of the dual-process goal-momentum model, this would typically involve shifting attention away from a frustrated type 2 longer term goal to pursue a type 1 goal offering instant gratification, e.g., a food treat. (N.B. Such ‘treats’ could be adaptive or maladaptive.)

It would also be possible to shift one’s attention from a blocked type 2 goal to an unblocked type 2 goal. This, however, would encroach on activities categorised under the ‘goal momentum’ heading, as illustrated in Q11 of the TI section, e.g., searching for alternative secondary routes to achieve a higher order primary goal, or considering what alternative goals might be satisfied when others are blocked. Thus, to clarify the distinction between the two conditions for Study 3, the goal-momentum condition was designed to help participants maintain a sense of progress with respect to longer term type 2 goals, either by helping them overcome problems blocking the pursuit of a currently activated goal, find alternative pathways to satisfy the same underlying primary goal, or satisfy alternative primary goals. In contrast, the goal-state substitution condition was designed to provide temporary relief from adverse type 2 goal states, by accessing type 1 sources of instant gratification. Within the confines of a writing intervention, this involved thinking and writing about pleasurable type 1 activities, rather than directly experiencing them. As the distinction between the two interventions was based on type 1 versus type 2 goal pursuits, it was hypothesised that participant reactions to the two might be moderated by individual differences in present versus future focus, as measured by the consideration of future consequences scale (Strathman et al., 1994).

The goal-momentum intervention was termed ‘daily focus’ (Appendices E11, E12 and E13) and the goal-state substitution, ‘daily break’ (Appendices E9 and E10). Table 7.1 on the next page summarises key elements of the two interventions and any differences between the two.

Table 7.1 Key elements of the two interventions for Study 3

Design element	Daily focus	Daily break
Training guidance notes (TGN) section headings	<ol style="list-style-type: none"> 1. Login 2. Stress, its impact and the solution 3. Balancing your impulsive and rational self 4. Strategic intelligence (SI) 5. Perceptual intelligence (PI) 6. Tactical intelligence (TI) 7. Key questions about the training programme 8. Confirmation of participation 	<ol style="list-style-type: none"> 1. Login 2. Stress, its impact and solutions 3. Potential benefits of mental relaxation / positive mood generation 4. Interrupting negative thoughts and emotions 5. Creating positive thoughts and emotions 6. Key questions about the training programme 7. Confirmation of participation
TGN word count	3,025	2,442
TGN readability	Flesch reading ease = 51.0 Flesch-Kincaid grade level = 10.5	Flesch reading ease = 50.6 Flesch-Kincaid grade level = 10.7
Daily writing session (DWS) section headings	<ol style="list-style-type: none"> 1. Login 2. Perceptual intelligence 3. Tactical intelligence 	<ol style="list-style-type: none"> 1. Login 2. Interrupting negative thoughts and emotions 3. Creating positive thoughts and emotions
DWS word count	1,242	1,119
DWS readability	Flesch reading ease = 64.9 Flesch-Kincaid Grade level = 6.9	Flesch reading ease = 55.5 Flesch-Kincaid grade level = 9.2

The daily break intervention was designed to try to match the length, structure and content of the daily focus intervention as closely as possible. The two core elements of the training programmes were the training guidance notes and the daily writing sessions. The latter were entitled ‘My Daily Break’ and ‘My Daily Focus’. To match the perceptual intelligence / tactical intelligence components of the daily focus sessions, the daily break activities were also split into two components, ‘interrupting negative thoughts/emotions’ and ‘creating positive thoughts/emotions’ and a rationale provided for this. Nothing was devised, however, to match the strategic intelligence component of the daily focus intervention. Thus, daily focus participants were scheduled to complete one strategic intelligence session followed by seven daily focus sessions and daily break participants, eight daily break sessions.

As the daily focus intervention had one extra component (i.e., strategic intelligence), the relevant training guidance notes had eight sections, as opposed to seven for the daily break intervention, and approximately 20 per cent more words. The readability

indices were virtually identical, however, and corresponded to the reading age of an average 16 year old, which was considered an acceptable level given the administrative and highly literate nature of participants' work. There was more of a difference in the readability of the daily writing session templates, but as both required an even lower reading age than the training guidance notes, this was not deemed to be a problem.

The DWS word counts did not include the material in the 'More Info' boxes. There was more detail in the daily focus information boxes and ideally with more time, this could have been balanced too. However, it was thought unlikely that participants would check these additional boxes every day and so the interfaces encountered on a daily basis were expected to be broadly similar.

7.6.2.3 Ethical considerations

As noted in Chapter 2, there are many different ways of classifying coping behaviours. In basic terms, the daily focus / daily break distinction could be classified as problem-focused versus emotion-focused, or active coping versus avoidant. As avoidant coping is sometimes viewed as maladaptive (addressed in Chapter 2), this raised potential ethical issues about advocating such an approach to reducing stress. As highlighted by Suls & Fletcher (1985), avoidant coping may be appropriate in some circumstances, but as suggested by Baylis (2005), if taken to extremes, a reliance on quick fixes (i.e., type 1 pursuits) and reality evasion can undermine well-being.

Consequently, a further difference between the two interventions was that the daily break training guidance notes (Appendix E9) were more circumspect in their support of 'mental relaxation / positive mood generation' techniques as a means of reducing stress. Section 2, for example, highlighted that this approach was just one of many ways of dealing with stress. Also, section 6 emphasized that the study simply offered participants an opportunity to see if the techniques worked for them and that the research was about trying to match people to appropriate techniques. This risked possibly creating weaker outcome expectations for the daily break intervention, but ethical considerations took precedence.

7.7 Conclusion

This chapter has summarised the key revisions made to the goal-momentum intervention following Study 2. It has also explained the rationale for the design of the control condition for Study 3, which is the focus of the next chapter.

CHAPTER 8: STUDY 3 – RANDOMISED CONTROLLED TRIAL

8.1 Introduction

This chapter describes Study 3, which was designed to investigate the effects of two contrasting self-regulatory coping strategies. Study 2 found that the online goal-momentum intervention appeared to generate a wide range of improvements in self-report measures of psychological well-being. However, without a control condition, it was not possible to rule out other potential sources of influence. The next step, therefore, was to test the goal-momentum intervention against a control intervention. As highlighted in Chapter 7, it was important to use a control intervention that appeared to offer a plausible alternative means of reducing stress. The control condition was termed ‘daily break’ (DB) and was presented as a form of mental relaxation. The goal-momentum condition was termed ‘daily focus’ (DF) and encouraged participants to think about how best to achieve their goals each day. The key changes for Study 3 were:

- **Goal-momentum intervention:**
 - same structure, but some minor changes to wording and emphasis, as outlined in Chapter 7;
 - two week intervention as opposed to four to six weeks for Study 2.
- **Research design:**
 - introduction of a control condition with a distinctive but plausible mechanism for reducing stress;
 - recruitment within an organisation with no prior exposure to Studies 1 and 2;
 - inclusion of cortisol testing;
 - larger sample size to detect more subtle effects;
 - one pre- and one post-intervention assessment point for the main training period, as opposed to one pre- and three post-intervention for Study 2;
 - six-month follow-up (for self-report measures, not cortisol), as opposed to twelve-month follow-up for Study 2.

8.1.1 Aims, rationale and hypotheses

There were five principal aims for the study:

Aim 1: To investigate the effects of the two interventions on self-report measures of psychological well-being

It was anticipated that the daily focus intervention would generate a similar pattern of improvements to those found in Study 2. It was also expected that the daily break intervention would generate improvements. Though, in line with the findings of

Richardson & Rothstein (2008) cited in Chapter 2, of stronger effects for ‘cognitive-behavioural’ compared to ‘relaxation’ interventions, it was expected that the daily focus intervention would generate stronger or more widespread improvements than the daily break. Also, as the core difference between the two interventions related to whether or not participants were encouraged to focus on their goals, it was anticipated that they would differ most strongly with respect to goal progress (i.e., changes in total GOSS scores). The first two hypotheses were therefore:

Hypothesis 1: That engagement in the daily break and daily focus interventions would be associated with positive changes in scores on self-report measures of psychological well-being between Time 1 and Time 2.

Hypothesis 2: That the daily focus intervention would be associated with stronger or more widespread improvements than the daily break intervention, with total GOSS changes differing most between interventions.

Aim 2: To identify factors influencing the outcomes of the intervention

In Study 2, it was hypothesised that greater engagement (measured in terms of the number of completed writing sessions) would be associated with greater improvements in scores on self-report measures of psychological well-being. Though the correlations had been in the direction anticipated, only self-efficacy change had been significantly correlated with the number of writing sessions. A key question for Study 3, therefore, was whether the same pattern would emerge. The third hypothesis, therefore, was:

Hypothesis 3: That for both interventions, greater engagement (measured by the number of completed writing sessions) would be associated with greater improvements in scores on the self-report measures of psychological well-being addressed in hypothesis 1.

Study 2 had found significant correlations between the number of daily focus writing sessions and some person-related factors. A similar pattern of correlations was therefore expected for Study 3. Thus, the fourth hypothesis was:

Hypothesis 4: That engagement in the daily focus writing activities would be positively correlated with outcome expectations, consideration of future consequences and conscientiousness.

As the daily break intervention focused on satisfying type 1 rather than type 2 goals, it was considered that there could be an inverse pattern of correlations to those found in Study 2 for consideration of future consequences. For outcome expectations and

conscientiousness, however, a similar pattern of correlations was expected. Thus, the fifth hypothesis was:

Hypothesis 5: That for the daily break intervention, engagement in writing activities would be positively correlated with outcome expectations and conscientiousness, but negatively correlated with consideration of future consequences.

Aim 3: To investigate the sustainability of writing activities and any effects beyond the initial study

As with Study 2, participants were given the opportunity to continue with their writing activities beyond the end of the intervention. For daily focus participants, a similar pattern to the previous study was expected, i.e., relatively little continuation of writing activities, but retention of improvements at the long-term follow-up, which for practical reasons (i.e., length of PhD) was six months. Prediction was more difficult for the daily break condition, as it had not been tested before. However, based on Suls & Fletcher's (1985) findings that avoidant coping tends to be associated with better outcomes in the short term but not longer term, it was expected that any retention of improvements would be less persistent in the daily break condition. The sixth and seventh hypotheses, therefore, were:

Hypothesis 6: That improvements in scores on self-report measures of psychological well-being would be maintained for the daily focus group, even if the writing activities were not continued.

Hypothesis 7: That any retention of improvements for the daily break group would not be as strong or as widespread as for the daily focus group.

Aim 4: To investigate whether the interventions produced any physiological effects on cortisol levels

As highlighted in Chapter 3, section 3.3.3, different components of daily cortisol patterns appear to be regulated in different ways. The cortisol awakening response (CAR) appears to be associated with prior day psychological states, whereas cortisol levels post-CAR appear to be associated with same day psychological states. Generally, however, the more negative the cognitive and emotional state, the higher the cortisol levels. As the goal-momentum intervention in Study 2 appeared to enhance psychological well-being, it was anticipated that the daily focus intervention in Study 3 would help reduce cortisol levels. The eighth hypothesis, therefore, was:

Hypothesis 8: That the daily focus intervention would be associated with reductions in cortisol levels between T1 and T2.

As the daily break intervention was not expected to enhance psychological well-being to the same extent as the daily focus intervention, the ninth hypothesis was:

Hypothesis 9: That any cortisol reduction in the daily break condition would be less than in the daily focus condition.

Finally, as greater adherence was expected to intensify any effects of the interventions, the tenth hypothesis was:

Hypothesis 10: That greater engagement (measured by the number of completed writing sessions) would be associated with greater reductions in cortisol levels and greater differences between the two writing conditions.

Aim 5: To use the qualitative feedback to gain insights into the quantitative changes observed

As highlighted in Chapter 6, participants' writing sessions for Studies 2 and 3 generated a considerable amount of qualitative data. This was a by-product of the intervention testing process. Chapter 7 provided some illustrations of how such writing entries could be used to check participants' understanding and application of techniques, which in turn helped shape some of the revisions to the instructions for Study 3. It is possible that some form of systematic analysis of the complete qualitative dataset could yield further insights. Due to time, space and resource constraints, and the already considerable volume of quantitative data generated, this was not feasible within this thesis. However, Chapter 9 discusses some possible ways in which such data might be used in future research. For Study 3, the qualitative analysis focused on reviewing participants' questionnaire responses to open questions, to try to gain insights into patterns observed in the quantitative data.

8.2 Method

8.2.1 Design

The study followed the format of a randomised trial, but used two experimental conditions rather than experimental versus a 'neutral' control. As highlighted by Suls & Fletcher (1985), both avoidant and attendant/active coping interventions tend to show significant effects compared to 'no instruction' controls, which could simply be attributed to placebo effects. The focus of the present study, therefore, was to try to draw more subtle distinctions between the effects of different coping mechanisms.

For self-report measures of psychological well-being, a 3 x 2 mixed factorial design was used, with time as the within-participant element (3 levels: baseline; 2 weeks; 6 months) and writing condition as the between-participant element (2 levels: DB and

DF). For cortisol assessment, a 2 x 2 mixed factorial design was used due to budget constraints, i.e., no six-month follow-up. The target allocation ratio between groups was 50:50.

As in Study 2, the design incorporated both quantitative and qualitative elements and can be categorised as a mixed methods concurrent embedded experimental design (Creswell & Plano Clark, 2007; Creswell, 2009). The primary data collected was quantitative. The secondary, qualitative data was used as a manipulation check and to gain possible insights into quantitative changes.

8.2.2 Power and sample size calculations

A power calculation was performed using G*Power 3.1.5 (Faul et al., 2007) to determine the required sample size. Set input parameters were: α error probability of .05, power .80, two groups and two measurements (i.e., for the core 2 x 2 element of the study). As with Study 2, the default value of .5 for correlations among repeated measures was considered a reasonable minimum threshold, as many variables in Study 2 had comfortably exceeded this. With just two time points, nonsphericity correction (ϵ) was not an issue and, therefore, was set at 1. This generated a required sample size of 34 to detect a medium-sized interaction or within-group effect.

As the attrition rate in Study 2 had been approximately 30 per cent, this was factored into the calculation for Study 3, which raised the recruitment target to 48 participants. (N.B. The same attrition rate was used as it was assumed that the additional demands of cortisol sampling in Study 3 might be balanced by the shorter intervention length.) Due to material costs (approximately £60 per participant), there was a budgetary limit on the numbers that could be accepted for cortisol assessment and the target of 48 was considered feasible. There was no such limit, however, for the recruitment of participants not undergoing cortisol assessment. Further calculations suggested that with a total of 98 participants it would be possible to detect a medium-sized between-group effect. As this extended target involved no cortisol component, a further 20 as opposed to 30 per cent was added for attrition, generating a final target of 120 participants.

8.2.3 Participants

All participants were employees of Bristol City Council (BCC). The reason for the choice of sector, i.e., public administration, was that it was (i) reported as having a relatively high prevalence of work-related stress (Health and Safety Executive, 2013), and (ii) constituted an environment with no connection to Studies 1 and 2, which was a key requirement for RCT purposes. The inclusion criteria for non-cortisol participants were:

- Between 18 and 65 years of age.
- Desk-based, working in a back-office administrative, technical or support type role. As the daily focus intervention relied on participants having the scope to manage their own time, participants with limited autonomy (e.g., call centres or customer service desks) were excluded.
- Available for three consecutive weeks between February and May 2013.
- Full-time or part-time. (N.B. The initial aim had been to restrict recruitment to full-time staff. However, part-time staff were subsequently included, provided they were prepared to complete the full training programme. This, therefore, required Internet access for any elements completed at home.)

For participants also taking part in the cortisol assessment, the following further criteria were added:

- Only full-time staff working Mondays to Fridays during the daytime.
- Able to collect a sample kit from and return saliva samples to one of five main council buildings across Bristol, designated as weekly collection points.
- Not taking any medications that might affect cortisol levels. These included: psychoactive medicines, opioid analgesic painkillers, antihistamines, anti-inflammatories and steroidal medications (e.g., in creams for skin conditions).

No financial incentives were involved. Participants were simply offered a report of the eventual study findings.

8.2.4 Randomisation

A matched-pairs design was used. For each starting week, the available participants were arranged into cortisol pairs and non-cortisol pairs, matched by gender and approximate age. Group allocation within each pairing was then determined using a random number generator (<http://www.random.org/>), with odd/even numbers indicating the daily break / daily focus allocation. A running total was kept of the cumulative mean participant age and gender counts for each treatment group (for both cortisol and non-cortisol). If there was an odd number of participants in a particular starting week, the remaining participant was allocated in whichever way brought the running totals into closer balance. Cortisol assessment participants were also further matched applying the same procedures to smoking and medication status.

8.2.5 Materials

For the non-cortisol participants, all questionnaires and training materials were set up on the Bristol Online Survey website (<https://www.survey.bris.ac.uk/>). All participants

(cortisol and non-cortisol) were invited to complete the following three questionnaires: (a) Questionnaire 1 – baseline (T1) (Appendix E8); (b) Questionnaire 2 – two weeks (T2) (Appendix E14); and (c) Questionnaire 3 – six months (T3) (Appendix E15).

DB participants were emailed links to the following DB materials: (a) Daily break training guidance notes (Appendix E9); and (b) Daily break sessions (Appendix E10).

DF participants were emailed links to the following DF materials: (a) Daily focus training guidance notes (Appendix E11); (b) Strategic intelligence session (Appendix E12); and (c) Daily focus sessions (Appendix E13).

The participants scheduled for cortisol assessment each received an envelope containing the following materials:

- Instructions for collecting saliva (Appendix E5)
- A pen
- Two smaller brown envelopes (one for pre-intervention, one for post) each containing:
 - Two re-sealable plastic bags (one for Tuesday, one for Wednesday) each containing:
 - A sampling question sheet (Appendix E6)
 - Two post-it notes (to help remember sampling collection times)
 - Three salivettes, saliva sampling devices (Sarstedt Ltd., Leicester, England) each consisting of:
 - stopper
 - suspended insert or inner tube
 - sterile cotton swab (inside suspended inner tube)
 - base outer tube in which saliva is eventually collected after centrifuging

8.2.6 Measures

The online sociodemographic measures were identical to those used in Study 2.

Details of the scale measures used can be found in Chapters 4 and 6. The internal reliabilities and times of use of the various scales for Study 3 are shown in Appendices E16 and E17.

A Cronbach's α score of .7 was used as a cut-off point for acceptability (Kline, 1999). As with Study 2, TIPI agreeableness and emotional stability had very low scores and were therefore not used. As TIPI conscientiousness, openness to experience and extraversion were between .6 and .7, they were used but the results interpreted with caution. The same applied to ISEL-12 tangible support.

As the TIPI internal reliability weaknesses had already been apparent in Studies 1 and 2, alternatives highlighted by Gosling et al. (2003) were considered. However, as the briefest consisted of 40 items, the TIPI was retained to avoid overburdening participants. Internal reliability was also poor for some of the brief COPE subscales (see Appendix E17) and this is addressed in section 8.3.1. Substitution with more comprehensive alternatives was again ruled out due to concerns about overburdening participants. The REI cognitive style scale was not retained from Study 2 due to apparent limitations discussed in Chapter 6, section 6.4.2.3.

8.2.7 Procedure

The study ran between January and May 2013, with the six-month follow-up in November. There were three phases of recruitment emails targeting different groups of BCC staff:

- Phase 1: Health at Work Research Group – a mailing list of 431 respondents to a previous staff survey who had indicated an interest in participating in health-related research:
 - Pre-notification: 16.01.13
 - Main request: 24.01.13
 - Reminder: 30.01.13
- Phase 2: Brunel House and City Hall – approximately 1200 staff:
 - Pre-notification: 13.02.13
 - Main request: 21.02.13
 - Reminder: 27.02.13
- Phase 3: Amelia Court and B Bond – approximately 500 staff:
 - Pre-notification: 13.03.13
 - Main request: 20.03.13
 - Reminder: 27.03.13

The emails outlined the study and the inclusion/exclusion criteria and provided a link to the advert (Appendix E1) on the relevant University of Bath ‘participate in projects’ webpage. This in turn contained links to the participant information sheet (Appendix E2) and consent form (Appendix E3). On return of the latter, participants were emailed the research study options form (Appendix E4), which addressed their eligibility and availability.

The subsequent training and assessment was organised into two six week blocks, either side of the 2013 Easter break, with four starting weeks in each block, as shown in Table 8.1 below.

Table 8.1 Study 3: Training periods

Period	Start date	End date
1	Tuesday 5 February	Thursday 21 February
2	Tuesday 12 February	Thursday 28 February
3	Tuesday 19 February	Thursday 7 March
4	Tuesday 26 February	Thursday 14 March
	Easter break	
5	Tuesday 9 April	Thursday 25 April
6	Tuesday 16 April	Thursday 2 May
7	Tuesday 23 April	Thursday 9 May
8	Tuesday 30 April	Thursday 16 May

The training and assessment for each participant spanned three weeks, as shown in the table in the participant information sheet (Appendix E2). As there was one extra component to the daily focus intervention, DF participants were instructed to complete an initial strategic intelligence session followed by seven daily focus sessions. DB participants were instructed to complete eight daily break sessions.

Participants' completion of questionnaires and writing activities were monitored online. If they failed to complete a questionnaire on the target date, they were emailed a follow-up reminder the next day. If there was still no response, a final reminder was sent two to three days later. For the writing activities, where necessary, just one reminder was sent at the start of each week.

Participants scheduled for cortisol assessment were instructed to collect their sampling kit from an appropriate collection point, the week before the start of their training. Cortisol assessment was based on saliva samples that participants collected themselves using the salivettes described in section 8.2.5. Participants were instructed to collect three samples per day: on awakening, waking plus 30 minutes, and 10pm, on two consecutive work days (Tuesday and Wednesday), pre- and post-intervention, totalling 12 samples per participant. The sampling kit instructions (Appendix E5) explained the various food, drink, medicine and storage restrictions important for cortisol assessment. Participants were also asked to complete a brief paper-based saliva sampling questionnaire (Appendix E6), to record the time of sampling, their mood on a simple Likert scale, and to note any sampling problem that may have occurred, e.g., wrong test tube or timing.

To help participants remember to take their samples at the designated times and return them on the designated days, automated text prompts were sent to their mobile

phones, using a bulk SMS texting service (www.bulksms.co.uk). The contents and timing of the text messages are provided in Appendix E7.

Samples were scheduled for return to the designated collection points on the Thursday of each week. They were stored overnight in BCC refrigerators and collected each Friday by the researcher (SD), who transported them back to the University of Bath in thermally insulated cool storage bags containing freezer blocks. Upon arrival at the University of Bath they were spun at 3000 rpm for three minutes to force the saliva from the cotton swab, through a hole in the base of the insert and into the outer tube of the salivette.

The centrifuging process forces any mucous, cellular material or other solids into the conical base of the outer tube. To comply with the Human Tissue Act (2004), an acellular aliquot of the clear supernatant was then pipetted from the top of the solution and transferred into a smaller 1.5 ml Eppendorf polypropylene tube for storage, while the remainder of the samples and salivette components were destroyed. The Eppendorf tubes were then stored in a freezer at minus 20 degrees centigrade until assaying at the end of the study. A review by Hansen, Garde, & Persson (2008) concluded that saliva samples can be stored at this temperature for at least one year without any effect on cortisol concentrations.

The samples were subsequently assayed by the researcher (SD) using enzyme immunoassay kits, supplied by Salimetrics Europe Ltd., following the supplier's specified salivary cortisol testing protocol (Revision: August 2012). All saliva samples were tested in duplicate with three participants' samples per microtitre plate (either 2 DB/1DF or 2DF/1DB).

The testing protocol involved adding a series of chemical reagents to the sample wells on the microtitre plate, which ultimately coloured the solutions in inverse proportion to the amount of cortisol present. The cortisol readings were then generated by an optical density plate reader (Anthos ht III) and software (Stingray version 1.5), which compared the colour intensities of the study samples (unknowns) to a range of standard samples on each microtitre plate with known cortisol content. The results were imported into SPSS along with the reported sampling times from participants' saliva sampling question sheets.

The inter-assay coefficient of variability, comparing high and low cortisol controls across 13 microtitre plates used, was 7.46 per cent, well within the acceptable level of 15 per cent specified by Salimetrics. The level specified as acceptable for the intra-assay coefficient of variability (i.e., between each sample pair) was below 10 per cent. The level for the first plate attempted without supervision, following an initial training

session, was unacceptable at 21.77 per cent. From this particular plate, only results within the acceptable 10 per cent range were used.

The intra-assay coefficient of variability across the 12 remaining plates was 10.33 per cent. This relatively high variability was attributable to the fact that a third of the samples (i.e., evening readings) contained very low levels of cortisol and thus any differences between pairs of low cortisol content samples constituted much higher variability in percentage terms compared to similar differences between pairs of high cortisol content samples.

Accuracy of sample timing is critical, particularly for deriving reliable measures of the cortisol awakening response (Griefahn & Robens, 2011; Smyth, Clow, Thorn, Hucklebridge, & Evans, 2013). Designated and actual (reported) sampling times were reviewed. Any results based on erratic timings, delays of greater than ten minutes or suspect patterns of change (i.e., CAR decrease rather than increase) were excluded. For details, see section 8.3.7.

As all aspects of the study were conducted by the sole researcher (SD), there was no researcher blinding regarding which participants were in which condition. Participants were only informed about their own intervention and asked not to discuss the content with colleagues.

8.2.8 Data preparation

The BOS survey data was imported into SPSS following the same procedure as for Studies 1 and 2. Again, there were no missing values for the main scale measures on completed online questionnaires, due to the mandatory response settings used. The data was screened in the same way as for Study 2, as outlined in section 6.2.7. One key difference, however, was that screening tests for Study 3 were performed with the data grouped according to training type, i.e., DB versus DF.

One participant reported that she had incorrectly ticked '1 strongly disagree' to all 12 Time 1 HINT habitual negative thinking items. Her intended answer had been '5 strongly agree', but when she realised her mistake, she was not able to return to the relevant webpage. Her T1 HINT scores were therefore changed from 1's to 5's. Two participants appeared to have incorrectly entered their weight, with one entering 9.8 kg and the other 80 stones. As they could have been interpreted in very different ways (e.g., 98 kg, 9.8 stones) and constituted one case from each training group (i.e., DB and DF), they were excluded from the relevant BMI randomisation checks. (N.B. BMI was included in the randomisation checks as it has been reported that obesity can influence cortisol levels, e.g., Andrew, Phillips, & Walker, 1998.) A further five

participants (3 DB and 2 DF), all female, declined to report their weight. As there was no reliable way of accurately estimating the resultant missing BMI values, they were also excluded from the relevant randomisation checks.

One DB participant failed to provide an answer for education and total work hours and was excluded from the relevant randomisation checks. Three DB participants and one DF participant failed to provide answers for pay grade. They were also excluded from the relevant analyses. According to Tabachnick & Fidell (2013), if less than 5 per cent of data points are missing in a random fashion, then whatever treatment (e.g., deleting cases, estimating missing values) should yield similar results.

To check for univariate outliers, boxplots were created for all the main variables at each time point and split by training group. Where the boxplot indicated outliers, standardized z scores were generated for more detailed assessment. Extreme standardized scores above $z = \pm 3.29$ were substituted with raw scores one unit larger or smaller than the next most extreme score in the relevant distribution, as suggested by Tabachnick & Fidell (2013). The following variables were adjusted in this way: T1 Participant reported BMI, T1 Self-efficacy, T3 Self-efficacy, T1-T2 Negative affect change, T1-T2 HADS anxiety change, T1-T2 HINT change, and T1-T2 Cortisol awakening response (CAR) change.

Normality of distribution was checked for each treatment group in the same way as described in Study 2 and the same sets of transformations applied. The following transformations yielded improved normality distributions: square root for T1, T2, T3 Positive affect; T1, T2, T3 Total GOSS; T1-T2 Total GOSS change; T1, T2 Cortisol awakening response: logarithm for T1, T2, T3 Negative affect; T1, T2, T3 HADS depression; T1-T2 Self-efficacy change; T1, T2 Duration-corrected cortisol AUC_G: reciprocal for T1 Participant reported BMI: reverse square root for T1, T2, T3 HINT; T1, T2, T3 Self-efficacy; T1 Conscientiousness; T1-T2 HADS anxiety change; T1 ISEL appraisal, belonging and tangible social support: and reverse reciprocal for T1, T2 Cortisol slope (2-3) and T1, T2 Cortisol slope (1-3).

As transformations could not always guarantee optimal distributions for each time point and group, as in Study 2 a further measure to address normality violations was to use bootstrapping (Efron & Tibshirani, 1993) when conducting analyses.

8.2.9 Data analysis

Statistical analyses were conducted using IBM SPSS version 21. Differences between the DB and DF groups in terms of baseline measures, experimental manipulation checks, attrition and adherence were analysed using Chi square tests for categorical

variables, independent t-tests for parametric continuous variables and Mann-Whitney U tests for non-parametric continuous variables.

Principal components analysis with varimax rotation was used to explore possible higher order groupings of COPE subscale items. Hypotheses involving group differences were tested using mixed ANOVAs, paired-samples t-tests and independent t-tests. Hypotheses involving relationships between variables were tested using Pearson product moment correlations for parametric data and Kendall's tau for non-parametric data.

For cortisol, statistical analyses were based on the following four measures: the cortisol awakening response (CAR), the total release of cortisol across the day and two diurnal slope measures, the slope of the post-peak (sample 2 to sample 3) decline and the slope of awakening to evening (sample 1 to sample 3) decline. There are different ways of calculating these various measures. In this study, the cortisol awakening response, the increase in cortisol following waking, was calculated by subtracting the first sample from the second sample. This is referred to as the CAR_i (i = increase) and is the most common way of calculating the CAR (Chida & Steptoe, 2009). The total release of cortisol across the day was measured using a widely used formula specified by Pruessner, Kirschbaum, Meinlschmid, & Hellhammer (2003), termed 'area under the curve with respect to ground (AUC_G)'. In this particular study, with just three samples per day, AUC_G was calculated as:

$$AUC_G = \{[(\text{Sample 1} + \text{Sample 4})/2 + (\text{Sample 2} + \text{Sample 5})/2] / 2 \times [(\text{Time 2} + \text{Time 5})/2 - (\text{Time 1} + \text{Time 4})/2]\} + \{[(\text{Sample 2} + \text{Sample 5})/2 + (\text{Sample 3} + \text{Sample 6})/2] / 2 \times [(\text{Time 3} + \text{Time 6})/2 - (\text{Time 2} + \text{Time 5})/2]\}$$

This was the formula for the pre-intervention values based on samples 1 to 6. The post-intervention formula used samples 7 to 12. A 'duration-corrected' version of AUC_G was also calculated by dividing the AUC_G total by the time difference from first to last sample each day, i.e., to generate a more standardised figure for each participant.

The diurnal slope measures can either be calculated by using the area under the curve or by using regression analysis to estimate the gradient of the slope. As the area under the curve had already been incorporated into the AUC_G measure, the gradient offered a more distinct alternative. As there were just two data points involved for each slope calculation, i.e., either the first and third or second and third sample of each day, it was possible to calculate the gradient simply by dividing the cortisol difference by the time difference, as indicated below for the 2-3 slope:

$$T1 \text{ Slope } 2-3 = \{[(\text{Sample } 2 + \text{Sample } 5)/2 - (\text{Sample } 3 + \text{Sample } 6)/2] / [(\text{Time } 3 + \text{Time } 6)/2 - (\text{Time } 2 + \text{Time } 5)/2]\}$$

This was the formula for the pre-intervention values. The post-intervention formula used samples 7 to 12.

Bootstrapping was set at the level of 1000 samples recommended by Field (2013). Significance levels (2-tailed) were set at $\alpha = .05$ throughout. In Chapter 6, the convention was followed of applying Bonferroni corrections to reduce the risk of Type I error from multiple comparisons. However, as highlighted in the discussion section of Chapter 6, this practice can hinder the accumulation of knowledge by restricting the full reporting of results. In this chapter, therefore, multiple analyses are presented without correction. As highlighted by Moran (2003), groupings of relatively high p values (e.g., just below or around .05) can be a stronger indication of genuine effects (i.e., less likely to be spurious) than an isolated very low p value.

The range of analyses presented in this chapter is broader than conventionally reported in academic journals, where the norm would be to focus on just those results reaching conventional statistical significance thresholds after any corrections for multiple comparisons. There are three key reasons for the more comprehensive approach. The first is that, as this thesis is about creating a framework and methodology for researching and developing interventions, it is important to highlight not only possible strengths (e.g., significant changes), but also possible weaknesses (e.g., non-significant changes). The second is that when operating in a post-positivist rather than positivist paradigm (e.g., complex field experimentation rather than more tightly controlled laboratory experimentation), it may be more common for results of interest to fall short of conventional statistical significance thresholds. Though such data clearly needs to be interpreted with caution, it could still provide useful feedback for ongoing development. The third is that to maximize opportunities for collaboration in the development of interventions, the sharing of results needs to be as comprehensive as possible.

8.2.10 Ethics

Ethical approval for Study 3 was granted by the University of Bath, Department of Psychology Research Ethics Committee under reference number 12-175.

8.3 Results

8.3.1 Sample characteristics

One hundred and nineteen people signalled their intention to participate in the study by returning consent forms. Sociodemographic and psychological characteristics were assessed at baseline for the 101 participants who subsequently completed the introductory questionnaire. Of these 101, 70 were female and 31 male. Table 8.2 below presents the key characteristics analysed by treatment group.

Table 8.2 Study 3: Participant sociodemographic characteristics by group at T1

Variable	Daily break (N = 49)	Daily focus (N = 52)	<i>p</i> value
Age (years)	45.51 ± 10.47 (N = 46)	45.81 ± 9.80 (N = 51)	.883
BCC pay grade	10.37 ± 2.56 (N = 48)	10.69 ± 2.60 (N = 52)	.547
Total hours per week	35.95 ± 6.95 (N = 45)	35.68 ± 9.04 (N = 49)	.865
BMI	25.88 ± 4.53	25.00 ± 3.61	.367 ¹
Gender			
Female (%)	33 (67.3)	37 (71.2)	.829 ²
Male (%)	16 (32.7)	15 (28.8)	
Ethnicity			
White (%)	47 (95.9)	48 (92.3)	.679 ²
Non-white (%)	2 (4.1)	4 (7.7)	
Marital/Partnership status			
Married/partnered (%)	32 (65.3)	32 (61.5)	.837 ²
Unmarried/unpartnered (%)	17 (34.7)	20 (38.5)	
Education	(N = 48)	(N = 52)	
Up to A level (%)	13 (27.1)	8 (15.4)	.263 ²
HE certificate/diploma (%)	6 (12.5)	3 (5.8)	
UG degree (%)	19 (39.6)	26 (50.0)	
PG degree (%)	10 (20.8)	15 (28.8)	
Children			
Children (%)	31 (63.3)	33 (63.5)	1.000 ²
No children (%)	18 (36.7)	19 (36.5)	
Smoker			
Non-smoker (%)	44 (89.8)	47 (90.4)	1.000 ²
Smoker (%)	5 (10.2)	5 (9.6)	

Data are raw means ± SD or N (%): N = 49 and 52 for DB and DF, respectively, unless otherwise stated.

¹ Raw means ± SD shown, but comparisons made on appropriately transformed data.

² Fisher's exact.

The absence of any statistically significant differences between the two treatment groups suggested the randomisation had been successful with respect to socio-demographic variables. Table 8.3 below presents the baseline values for self-report measures of psychological well-being, again analysed by treatment group.

Table 8.3 Study 3: Participant psychological characteristics by group at T1

Variable	Daily break (N = 49)	Daily focus (N = 52)	<i>p</i> value
PNES positive affect	2.71 ± 0.81	2.69 ± 0.78	.934 ¹
PNES negative affect	2.53 ± 0.91	2.56 ± 0.75	.615 ¹
PSS perceived stress	32.86 ± 7.64	33.94 ± 6.79	.452
HADS anxiety	16.49 ± 4.43	17.21 ± 4.93	.442
HADS depression	12.82 ± 3.36	12.65 ± 4.07	.616 ¹
Total GOSS goal status	-2.41 ± 6.86	-2.19 ± 8.27	.974 ¹
GSE self-efficacy	29.41 ± 4.31	28.98 ± 4.34	.653 ¹
HINT habit index	44.88 ± 10.15	45.19 ± 11.49	.810 ¹
W-BNS autonomy	17.73 ± 4.68	17.67 ± 4.32	.945
W-BNS competence	21.39 ± 5.50	22.69 ± 5.18	.223
W-BNS relatedness	18.90 ± 5.46	19.87 ± 5.74	.388
LOT-R optimism	14.02 ± 5.94	13.88 ± 5.51	.905
CFC future consideration	3.31 ± 0.72	3.23 ± 0.62	.542
ISEL appraisal support	3.10 ± 0.74	3.23 ± 0.75	.397 ¹
ISEL belonging support	3.01 ± 0.65	3.05 ± 0.68	.686 ¹
ISEL tangible support	3.28 ± 0.50	3.14 ± 0.68	.311 ¹
TIPI extraversion	8.57 ± 3.11	7.67 ± 3.48	.175
TIPI conscientiousness	9.96 ± 2.87	10.52 ± 3.17	.249 ¹
TIPI openness to experience	10.71 ± 2.32	9.52 ± 2.78	.021

Data are raw means ± SD.

¹ Raw means ± SD shown, but comparisons made on appropriately transformed data.

Of the 19 measures listed, only one, TIPI openness to experience, showed a statistically significant difference and is addressed later in this section. (N.B. The other two TIPI measures, agreeableness and emotional stability, were excluded due to poor internal reliability, but neither showed any significant group differences, with *p* values of .785 and .907, respectively.)

Baseline data was also examined for possible group differences in COPE scores. As many of the COPE subscales had low Cronbach's α scores, a principal components analysis (PCA) with orthogonal (varimax) rotation was conducted on T1 scores to investigate alternative and/or possible higher order groupings of the 28 items. The factorability of the R-matrix (i.e., matrix of correlations between the 28 items) was checked with two tests. The first was Bartlett's (1954) test of sphericity, recommended

by Tabachnick & Fidell (2013) where there are fewer than five cases per variable, as in this study. The test was statistically significant ($p < .001$), indicating that the variables/items were sufficiently correlated for PCA. The second was the Kaiser-Meyer-Olkin measure of sampling adequacy, which is the ratio of the sum of squared correlations of the R-matrix to the sum of squared correlations plus sum of squared partial correlations. This measure ranges from 0 to 1. The closer to 1, the more compact the pattern of correlations and more likely to yield distinct components. A ratio greater than .5 is considered acceptable (Kaiser, 1974) and the result was well above this at .71.

Table 8.4 on the next page shows the eight components extracted that had eigenvalues above Kaiser's criterion of 1 (Kaiser, 1958). Together they explained 72.51 per cent of the variance. The scree plot for the analysis is shown in Figure 8.1 below. As there was no clear single point of inflection to help determine how many components to retain, a parallel analysis / Monte Carlo simulation check was run using O'Connor (2000) SPSS syntax. This revealed that the Eigenvalues for the first five components extracted were statistically significant. The result was the same whether based on normally distributed random data generation or permutations of the original raw data set (using 1000 parallel data sets in both cases).

Figure 8.1 Study 3: PCA scree plot for T1 COPE items

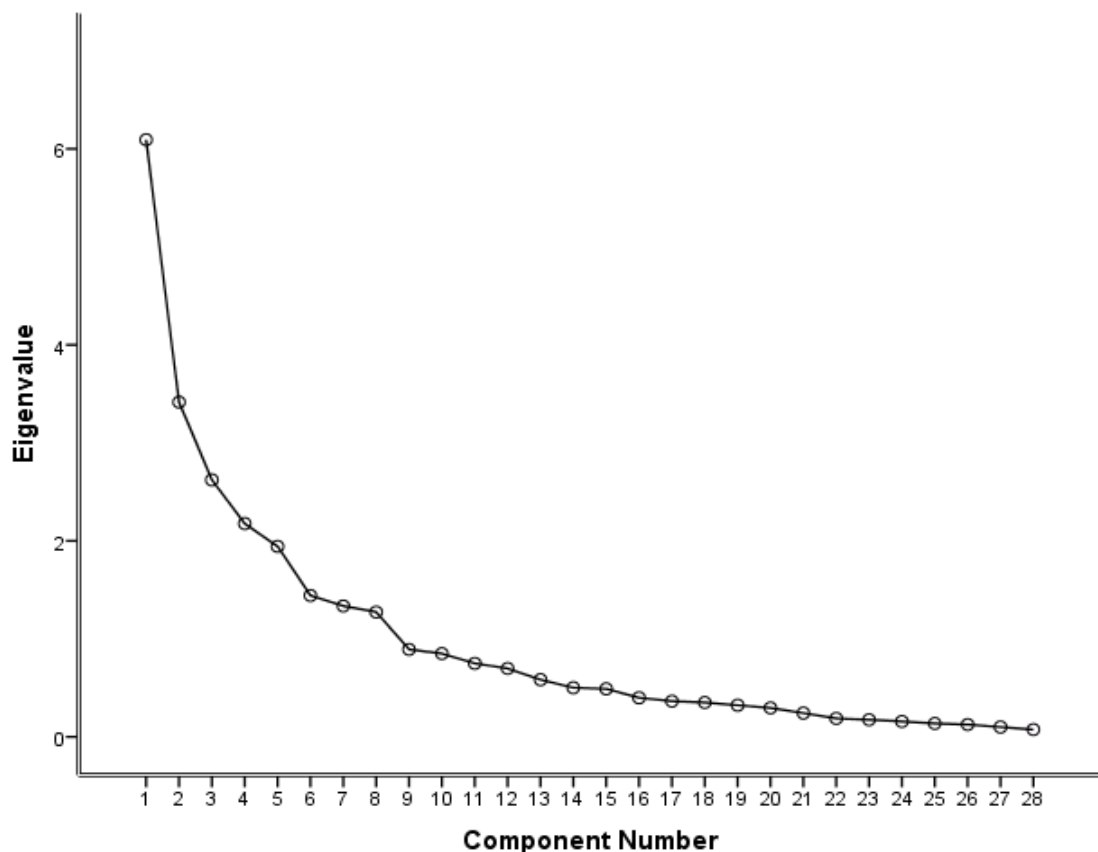


Table 8.4 Study 3: Principal components analysis rotated component loadings

Item number	Subscale	COPE item	Component							
			1	2	3	4	5	6	7	8
Q1cope02	Active coping	I concentrate my efforts on doing something about the situation I'm in.	.83							
Q1cope25	Planning	I think hard about what steps to take.	.82							
Q1cope07	Active coping	I take action to make the situation better.	.79	.34						
Q1cope14	Planning	I try to come up with a strategy about what to do.	.78	.31						
Q1cope20	Acceptance	I accept the reality of the fact that it has happened.	.70							
Q1cope24	Acceptance	I learn to live with it.	.54							.36
Q1cope16	Behavioural disengagement	I give up the attempt to cope.	-.45							.31
Q1cope05	Emotional support	I get emotional support from others.		.86						
Q1cope10	Instrumental support	I get help and advice from other people.		.85						
Q1cope23	Instrumental support	I try to get advice or help from other people about what to do.		.84						
Q1cope15	Emotional support	I get comfort and understanding from someone.		.82						
Q1cope26	Self-blame	I blame myself for things that happened.			.85					
Q1cope13	Self-blame	I criticize myself.			.80					
Q1cope11	Substance use	I use alcohol or other drugs to help me get through it.			.56	.41			.31	

Q1cope18	Humour	I make jokes about it.								.91
Q1cope28	Humour	I make fun of the situation.								.90
Q1cope04	Substance use	I use alcohol or other drugs to make myself feel better.				.46	.50		.31	.32
Q1cope27	Religion	I pray or meditate.							.94	
Q1cope22	Religion	I try to find comfort in my religion or spiritual beliefs.							.93	
Q1cope09	Venting emotions	I say things to let my unpleasant feelings escape.							.75	
Q1cope17	Positive reinterpretation	I look for something good in what is happening.	.37	.36					-.62	
Q1cope21	Venting emotions	I express my negative feelings.				.32			.58	
Q1cope12	Positive reinterpretation	I try to see it in a different light, to make it seem more positive.	.39	.39					-.47	.35
Q1cope03	Denial	I say to myself - 'this isn't real'.								.79
Q1cope08	Denial	I refuse to believe that this has happened.								.75
Q1cope19	Distraction	I do something to think about it less, such as going to the cinema, watching TV, reading, daydreaming, sleeping, shopping, etc.								.80
Q1cope01	Distraction	I turn to work or other activities to take my mind off things.								.68
Q1cope06	Behavioural disengagement	I give up on trying to deal with it.								.49
Eigenvalues			6.09	3.42	2.62	2.18	1.94	1.44	1.34	1.27
% of variance			21.76	12.20	9.36	7.77	6.94	5.15	4.77	4.55

Items incorporated into higher order groupings are shown in bold.

The first component contained item pairings covering active coping, planning, acceptance and positive reinterpretation, and accounted for 21.76 per cent of the variance. As these types of coping corresponded to elements of the daily focus intervention, they were considered for possible use as a form of manipulation check. To this end, principal components analysis was also conducted on T2 COPE scores. At T2, items 16 and 24 did not load sufficiently onto component 1 and so were excluded from the composite scale, which was subsequently named 'daily focus coping'. The retained items are highlighted in bold in Table 8.4. Cronbach's α for these seven items was .87 at T1 and .82 at T2.

The four items in bold type that solely loaded onto component 2 represented the two types of social support, emotional and tangible, featured in the brief COPE. Cronbach's α for these four items was .90 at T1 and .88 at T2. Within components three to eight, there were some pairings of the 2-item subscales, but none of these pairings were consistent across the T1 and T2 principal components analyses. Thus, the remaining COPE subscales were used in their original 2-item groupings, particularly as higher order groupings created lower Cronbach's α scores.

A randomisation check was then performed on the resulting COPE subscales. As shown in Table 8.5 below, only one of the ten coping measures, 'distraction', showed a statistically significant difference between groups.

Table 8.5 Study 3: Participant coping scale scores by group at T1

Variable	Cronbach's α	Daily break (N = 49)	Daily focus (N = 52)	<i>p</i> value
Daily focus coping (7 items)	.87	2.64 \pm 0.63	2.65 \pm 0.67	.922
Social support (4 items)	.90	2.44 \pm 0.80	2.55 \pm 0.82	.561 ¹
Religion	.93	1.47 \pm 0.86	1.29 \pm 0.63	.338 ¹
Humour	.89	2.19 \pm 1.02	2.19 \pm 0.88	.846 ¹
Substance use	.87	1.54 \pm 0.71	1.58 \pm 0.85	.698 ¹
Self-blame	.79	2.59 \pm 0.96	2.53 \pm 0.88	.770 ¹
Venting	.69	2.33 \pm 0.85	2.39 \pm 0.80	.706 ¹
Behavioural disengagement	.67	1.45 \pm 0.66	1.51 \pm 0.63	.488 ¹
Denial	.53	1.26 \pm 0.45	1.29 \pm 0.47	.614 ¹
Distraction	.52	2.73 \pm 0.79	2.33 \pm 0.72	.010 ¹

Subscales consist of 2 items, unless otherwise indicated.

¹ *p* value derived from Mann-Whitney U due to non-normal distribution.

With only two variables out of more than 40 tested showing significant differences, the randomisation appeared to have been successful. Applying a Bonferroni correction for this number of comparisons would have rendered the two exceptions non-significant. However, consideration was given to whether these two variables should be controlled

for in subsequent analyses (e.g., using ANCOVAs). As the Cronbach's α scores were low for both TIPI openness to experience and coping by distraction, differences in the composite items were reviewed. 'Open to new experiences, complex' and 'conventional, uncreative' (reversed) made up the TIPI variable. Their p values were .055 and .042, respectively, and so were relatively balanced. For the coping by distraction variable, the p values were .243 for item 1 '*I turn to work or other activities to take my mind off things*' and .001 for item 19 '*I do something to think about it less, such as going to the cinema, watching TV, reading, daydreaming, sleeping, shopping, etc.*'. Consequently, item 19 appeared to be the key source of difference.

Correlation analyses showed no significant or close to significant covariation between TIPI openness to experience, T1 COPE item 19 and Time 1 to Time 2 changes in the psychological well-being variables assessed. Consequently, they were not controlled for in the T1-T2 change analyses. However, they did appear to be correlated with the number of writing sessions performed and so are addressed in section 8.3.5 below.

For Study 2, both per-protocol and intention-to-treat analyses were conducted. For Study 3, just per-protocol analyses were conducted as the focus was on understanding the effects of the different coping mechanisms rather than assessing interventions as a whole. In view of the per-protocol focus, the randomisation checks were repeated on the basis of 'completers' (88 participants who completed questionnaire 2), as opposed to 'starters' (101 participants who completed questionnaire 1). The same variables showed significant differences as before and no other variables were close to significance. The 'completer' group difference p values for the significant variables ('starter' group difference in brackets) were: T1 openness to experience, .019 (.021); T1 coping by distraction, .014 (.010); T1 COPE item 19, .001 (.001).

8.3.2 Attrition and writing task adherence

Table 8.6 on the next page shows the numbers of participants at each key stage for the two training groups. Of 119 participants who returned consent forms, five withdrew and eight failed to reply to follow-up emails before randomisation. A further four failed to reply and one withdrew before completion of questionnaire 1. A further ten failed to reply and three withdrew before completion of questionnaire 2. Reasons given for withdrawals related to either lack of time or pressure of work. All participants were requested to complete questionnaire 2 whether continuing, withdrawing or not responding.

The analyses conducted for Study 3 constitute a form of graded per-protocol analysis, as adherence (measured by the number of writing sessions completed between T1 and T2) ranged from zero to nine sessions and hence was not an 'all-or-nothing' issue.

Intention-to-treat analyses were not conducted for two reasons. The first was that with 13 participants dropping out between questionnaires 1 and 2, and a further 22 between questionnaires 2 and 3, intention-to-treat analyses would have necessitated the creation of dummy variables, i.e., assumed rather than real data. The second, as previously stated, was that the priority was to explore the effects of the two contrasting coping mechanisms, rather than assess the net effectiveness of the interventions as a whole.

Table 8.6 Study 3: Participant attrition by group

Description	Daily break	Daily focus	Total
Signed consent form to participate	-	-	119
Randomised allocation	51	55	106
Completed questionnaire 1	49	52	101
Completed questionnaire 2	42	46	88
Completed 6-month follow-up questionnaire	34	32	66

Table 8.7 below shows that there were no statistically significant group differences for either attrition or adherence.

Table 8.7 Study 3: Attrition rates and adherence in percentage terms by group

Variable	Daily break (N = 49)	Daily focus (N = 52)	<i>p</i> value Fisher's exact
Attrition			
Completed Q1 only	7 (14.3)	6 (11.5)	.462
Completed Q1 and Q2 only	8 (16.3)	14 (26.9)	
Completed Q3 (+ 6 months)	34 (69.4)	32 (61.5)	
Writing task adherence			
Low (0-4 sessions)	28 (57.1)	23 (44.2)	.234
High (5-9 sessions)	21 (42.9)	29 (55.8)	

Data are N (%).

Four of the 32 DF participants who answered questionnaire 3 did not complete all sections, which accounts for the *df* variation between some outcome measures in later sections. If attrition were recalculated, reclassifying these four participants as having completed questionnaires 1 and 2 only, then the Fisher's exact probability value would be reduced to 0.11.

8.3.3 Experimental manipulation check

There are various ways in which manipulation checks can be performed. The priority for Study 3 was to try to ensure that any differences between treatment groups stemmed from the specific coping mechanisms tested, rather than from a possible

placebo effect that might arise between an experimental condition and an obvious neutral control. It was important, therefore, that both conditions were perceived by participants as plausible means of attempting to reduce stress. The figures in Table 8.8 below show participants' ratings of the perceived usefulness of the training after having read the relevant training guidance notes.

Table 8.8 Study 3: Perceived usefulness of training by group

Variable	Daily break (N = 45)	Daily focus (N = 50)	<i>p</i> value Fisher's exact
Perceived usefulness			
Unhelpful	1 (2.2)	1 (2.0)	.170
Unsure	14 (31.1)	7 (14.0)	
Perhaps helpful	22 (48.9)	28 (56.0)	
Definitely helpful	8 (17.8)	14 (28.0)	

Data are N (%).

Though the perceptions of usefulness were slightly higher for the DF condition, the majority of both groups believed their intervention to be 'perhaps' or 'definitely helpful', with no statistically significant difference between groups. When the comparison was made on the basis of the 88 'completers', rather than 101 'starters', the *p* value (Fisher's exact) for group difference was 0.257.

Another key manipulation aim was that participants should commit similarly to both interventions. The writing task adherence figures in Table 8.7 above showed that adherence was slightly higher in the DF condition, but again the difference between groups was not statistically significant, *p* = .234 (.282 based on 88 'completers').

As a further manipulation check, each participant's initial writing sessions were reviewed to confirm that they were applying the appropriate self-regulatory coping techniques. Though participants differed in the breadth and depth of application, there was a clear distinction in the nature of the written output between the two interventions.

As mentioned in section 8.3.1 above, consideration was also given to using repeated COPE measures as a form of manipulation check. In view of the limitations of self-report coping measures discussed in Chapter 2, it was questionable whether the COPE measures would be sensitive enough to detect the kind of qualitative changes in coping encouraged by the daily focus intervention and this appeared to be the case. Paired-samples *t*-tests were run for each group to examine differences between T1 and T2 'daily focus coping' scores. The measure increased marginally but not significantly for both groups. For daily break, the change was $t(41) = -1.16$, BCa 95% CI [-0.20, 0.05], *p* = .255 and for daily focus, $t(45) = -1.33$, BCa 95% CI [-0.20, 0.04], *p* = .191.

8.3.4 Experimental outcomes

This section addresses the first aim of investigating the effects of the two interventions on self-report measures of psychological well-being. It covers two hypotheses, the first of which was:

Hypothesis 1: That engagement in the daily break and daily focus interventions would be associated with positive changes in scores on self-report measures of psychological well-being between T1 and T2.

To examine the full pattern of possible changes, paired-samples t-tests were performed for all key outcome variables. The results are shown in Table 8.9 below, ordered in terms of the significance of the daily focus changes.

Table 8.9 Study 3: Results of paired-samples t-tests for T1-T2 changes in self-report measures of psychological well-being by group

Variable	Daily break				Daily focus			
	T1	T2	<i>t</i>	<i>p</i>	T1	T2	<i>t</i>	<i>p</i>
Negative affect	2.60 (0.91)	2.24 (0.78)	2.94	.005	2.52 (0.77)	2.14 (.63)	3.99	<.001 ¹
Total GOSS	-2.31 (6.91)	-1.07 (7.35)	-1.57	.123	-1.87 (8.18)	1.67 (8.29)	-3.26	.002 ¹
HADS anxiety	16.57 (4.53)	15.24 (4.51)	3.14	.003	17.02 (4.95)	15.39 (4.11)	3.09	.003
Optimism	14.26 (6.01)	14.52 (5.64)	-0.50	.620	14.00 (5.46)	15.28 (5.35)	-3.01	.004
Perceived stress	33.29 (7.59)	31.71 (7.09)	1.48	.148	33.50 (6.83)	31.09 (6.26)	2.92	.005
HADS depression	12.88 (3.40)	11.69 (3.00)	3.64	.001	12.37 (3.80)	11.39 (3.74)	2.34	.024 ¹
HINT	44.93 (10.18)	42.71 (10.66)	-1.66	.105	44.96 (11.81)	43.91 (9.23)	-1.31	.198 ¹
Positive affect	2.68 (0.85)	2.80 (0.75)	-1.31	.199	2.75 (0.75)	2.84 (0.83)	-1.01	.320 ¹
Self-efficacy	29.76 (4.33)	30.07 (3.52)	0.34	.733	29.04 (4.07)	29.41 (4.27)	0.86	.394 ¹
W-BNS autonomy	18.36 (4.34)	18.21 (4.69)	0.31	.758	17.93 (4.30)	18.28 (4.33)	-0.78	.440
W-BNS relatedness	19.52 (5.55)	20.17 (5.31)	-1.39	.172	19.98 (5.54)	20.24 (5.19)	-0.63	.534
W-BNS competence	21.86 (5.19)	21.93 (4.69)	-0.15	.881	22.74 (5.18)	22.59 (4.92)	0.34	.738

Degrees of freedom were (41) for daily break and (45) for daily focus.

¹ Raw means (SD) shown, but comparisons made on appropriately transformed data.

For both groups 11 out of 12 variables changed in a positive direction. For the DB condition, three variables showed statistically significant improvements; depression, anxiety and negative affect. For the DF condition, six variables showed statistically significant improvements; negative affect, goal status, anxiety, optimism, perceived stress and depression. Thus, with significant improvements for both groups, the first hypothesis was supported.

The second hypothesis was:

Hypothesis 2: That the daily focus intervention would be associated with stronger or more widespread improvements, with Total GOSS changes differing most between interventions.

The pattern of results in Table 8.9 above supported the first part of this hypothesis in that improvements were more widespread for the daily focus intervention. The second part of the hypothesis was investigated using 2 x 2 mixed design ANOVAs, with time as the within-participant variable and intervention group as the between-participant variable. The results are shown in Table 8.10 below, in order of significance of the main effect of time.

Table 8.10 Study 3: Results of 2 x 2 mixed design ANOVAs for T1-T2 changes in self-report measures of psychological well-being

Variable	Main effect of time			Group by time interaction		
	<i>F</i>	<i>df</i>	<i>p</i>	<i>F</i>	<i>df</i>	<i>p</i>
Negative affect	23.39	1, 86	<.001	0.08	1, 86	.781 ¹
HADS anxiety	18.72	1, 86	<.001	0.19	1, 86	.666
HADS depression	15.53	1, 86	<.001	0.03	1, 86	.863 ¹
Total GOSS	12.29	1, 86	.001	2.88	1, 86	.093 ¹
Perceived stress	8.91	1, 86	.004	0.40	1, 86	.530
Optimism	5.30	1, 86	.024	2.32	1, 86	.132
HINT	4.35	1, 86	.040	0.05	1, 86	.821 ¹
Positive affect	2.74	1, 86	.102	0.12	1, 86	.731 ¹
W-BNS relatedness	2.12	1, 86	.149	0.38	1, 86	.540
Self-efficacy	0.64	1, 86	.426	0.06	1, 86	.807 ¹
W-BNS autonomy	0.10	1, 86	.750	0.59	1, 86	.447
W-BNS competence	0.02	1, 86	.902	0.12	1, 86	.733

¹ Comparisons made on appropriately transformed data.
N.B. There were no significant main effects of group.

As none of the group by time interactions were statistically significant, the second part of hypothesis 2 was not supported. The absence of any significant group by time interactions suggested that the differentiation between the two interventions was not very strong. However, as the total GOSS result was the closest to a significant interaction ($p = .093$), it might be useful to retest the hypothesis with a larger, more powerful study.

To explore whether outcomes differed by gender, 2 x 2 x 2 mixed design ANOVAs were run for each outcome variable, with time as the within-participant variable and writing group and gender as between-participant variables. However, there were no significant group x gender interactions.

8.3.5 Factors predicting or influencing experimental outcomes

This section addresses the third, fourth and fifth hypotheses. The third hypothesis was:

Hypothesis 3: That for both interventions, greater engagement (measured by the number of completed writing sessions) would be associated with greater improvements in scores on the self-report measures of psychological well-being addressed in hypothesis 1.

A Pearson product moment correlation matrix was produced comparing the number of writing sessions with Time 1 to Time 2 change scores for each group. The results are shown in Table 8.11 on the next page, ordered in terms of the significance of the daily focus correlations.

For the DF group, only two correlations (perceived stress and HINT) were significant at the conventional .05 level and a third (HADS depression) approached significance, but all the relationships were in the expected direction, i.e., greater improvements as the number of writing sessions increased. Thus, hypothesis 3 was partially supported with respect to the daily focus intervention. (N.B. As previously stated, this type of field experimentation is closely aligned with the post-positivist paradigm, in which categorical black and white judgements rarely apply.)

For the daily break intervention, only the result for W-BNS competence was close to significance, with a p value of .054. However, the correlation was in the opposite direction to that expected, i.e., less improvement as writing sessions increased. Furthermore, this adverse trend applied to ten out of the twelve DB variables. Consequently, hypothesis 3 was not supported with respect to the daily break intervention.

Table 8.11 Study 3: Correlations between writing sessions and T1-T2 change scores by group

Variable	Daily break			Daily focus		
	<i>r</i>	<i>p</i>	95% BCa CI	<i>r</i>	<i>p</i>	95% BCa CI
Perceived stress	.10	.520	-.19, .36	-.41	.005	-.63, -.16
HINT	-.07	.670	-.40, .28	-.35	.016	-.59, -.09
HADS depression	.15	.338	-.09, .36	-.28	.059	-.47, -.02
Positive affect	-.07	.645	-.35, .23	.25	.094	-.05, .54
W-BNS competence	-.30	.054	-.51, -.02	.22	.149	-.03, .46
HADS anxiety	.18	.246	-.09, .41	-.20	.183	-.13, .51 ¹
Self-efficacy	-.26	.098	-.54, .04	.20	.187	-.15, .50
Total GOSS	-.06	.705	-.35, .24	.20	.195	-.10, .47 ¹
Optimism	-.04	.821	-.32, .23	.18	.231	-.13, .47
W-BNS relatedness	.09	.561	-.25, .43	.14	.343	-.12, .36
W-BNS autonomy	-.02	.908	-.30, .30	.09	.540	-.16, .35
Negative affect	.14	.380	-.19, .44	-.06	.687	-.41, .31

¹ Comparisons made on appropriately transformed data.

To explore the implications of these findings, 2 x 2 x 2 mixed design ANOVAs were conducted, with time as a within-participant variable and writing group and adherence as between-participant variables. The adherence variable was a binary split, with 0 to 4 writing sessions classified as low adherence and 5 to 9 writing sessions as high adherence. Table 8.12 on the next page shows the results for group x adherence interaction effects, ordered in terms of statistical significance.

As the table shows, there were significant group by adherence interaction effects for the first three variables (W-BNS competence, perceived stress and HADS depression). The results for a further two, self-efficacy and HADS anxiety, were approaching significance.

Table 8.12 Study 3: Group by adherence interaction effects for T1-T2 changes in self-report measures of psychological well-being

Variable	<i>df</i>	<i>F</i>	<i>p</i>
W-BNS competence	1, 84	13.64	<.001
Perceived stress	1, 84	7.84	.006
HADS depression	1, 84	4.22	.043 ¹
Self-efficacy	1, 84	3.81	.054 ¹
HADS anxiety	1, 84	3.33	.072
Total GOSS	1, 84	1.73	.193 ¹
Positive affect	1, 84	0.99	.322 ¹
Negative affect	1, 84	0.90	.347 ¹
Optimism	1, 84	0.88	.364
W-BNS autonomy	1, 84	0.24	.629
HINT	1, 84	0.21	.651 ¹
W-BNS relatedness	1, 84	0.08	.781

¹ Comparisons made on appropriately transformed data.

The interaction effects are illustrated graphically below in Figures 8.2 and 8.3. The example of perceived stress was chosen as the overall T1-T2 changes were significant for this variable and not for W-BNS competence (see Table 8.10).

Figure 8.2 Study 3: T1-T2 changes in perceived stress for daily break group

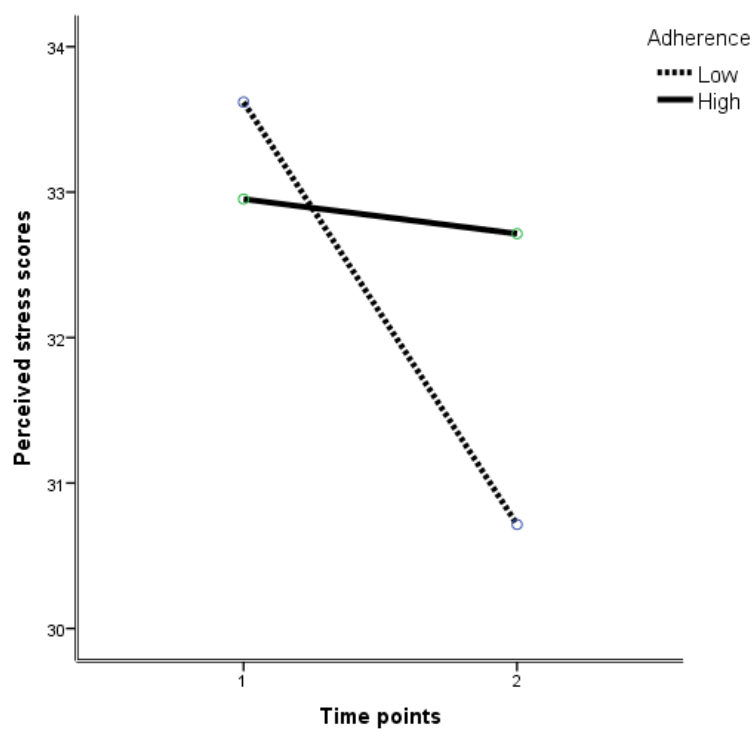
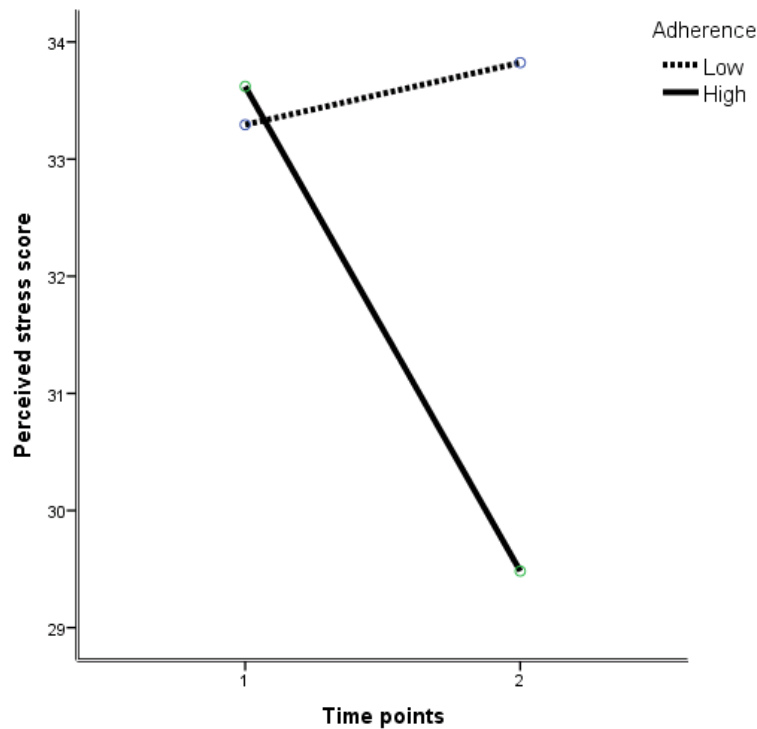


Figure 8.3 Study 3: T1-T2 changes in perceived stress for daily focus group



The figures show that in the DB group the strongest change was the reduction in perceived stress for participants with low adherence, $t(20) = 1.64$, BCa 95% CI [0.00, 6.29], $p = .117$. In the DF group the strongest change was the reduction in perceived stress for participants with high adherence, $t(28) = 3.76$, BCa 95% CI [1.91, 6.40], $p = .001$. The pattern was similar for W-BNS competence, HADS depression and self-efficacy, i.e., improvements associated with low adherence DB and high adherence DF, but not high adherence DB or low adherence DF.

The fourth and fifth hypotheses were:

Hypothesis 4: That engagement in daily focus writing activities would be positively correlated with outcome expectations, consideration of future consequences and conscientiousness.

Hypothesis 5: That engagement in daily break writing activities would be positively correlated with outcome expectations and conscientiousness, but negatively correlated with consideration of future consequences.

A Pearson product moment correlation matrix was produced, comparing the number of writing sessions with the same person-related factors as tested in Study 2, apart from the REI-type 1 and 2 scales, which had been dropped. As in Study 2, two of the five TIPI personality traits (agreeableness and emotional stability) were excluded due to poor internal reliability. COPE item 19 was added as it had been found to be correlated

with the number of writing sessions (see section 8.3.1). Table 8.13 below shows the correlations found for each group, ordered in terms of significance of the daily break correlations.

Table 8.13 Study 3: Correlations between T1 person factors and writing sessions by group

Variable	Daily break			Daily focus		
	<i>r</i>	<i>p</i>	95% BCa CI	<i>r</i>	<i>p</i>	95% BCa CI
TIPI openness to experience	.29	.047	.01, .54	.18	.198	-.10, .45
COPE item 19	-.21	.065	-.43, .01	-.02	.863	-.27, .24 ²
Self-efficacy	.27	.066	.02, .51	-.02	.904	-.37, .28 ¹
Outcome expectations	.23	.132	-.08, .53	.19	.194	-.05, .40
TIPI extraversion	.11	.448	-.15, .37	.26	.062	.01, .53
TIPI conscientiousness	.08	.605	-.19, .35	-.09	.519	-.34, .18 ¹
Participant age	.07	.614	-.21, .32	.05	.724	-.24, .35
CFC	.05	.730	-.22, .36	-.01	.970	-.32, .32

¹ Comparisons made on appropriately transformed data.

² Correlation based on Kendall's tau.

The table shows that engagement in the daily focus activities was not correlated as predicted with conscientiousness or consideration of future consequences. Only one of the hypothesised relationships (outcome expectations) was in the direction predicted, but the correlation was not statistically significant. Thus, hypothesis 4 was not supported

For hypothesis 5, again the relationships involving consideration of future consequences, conscientiousness and outcome expectations were not significant. Thus, hypothesis 5 was not supported. However, when the two treatment groups were combined, the correlation between outcome expectations and writing sessions was statistically significant and in the direction predicted, $r = .23$, 95% BCa CI [.02, .41], $p = .026$.

The only significant predictor of DF writing sessions was 'extraversion'. Although the p value was not statistically significant, as the bootstrapped confidence intervals did not cross zero, this supported the likelihood of a genuine relationship. Also, DF participants with low adherence were significantly lower on extraversion than high adherence, $t(50) = -2.67$, $p = .010$.

Of the two variables (openness to experience and COPE item 19, i.e., coping by turning to pleasant distractions) that had significantly differed between groups in the

randomisation checks (i.e., higher in DB participants), the first was a significant predictor of DB engagement, but not DF engagement. The second was also close to being a significant predictor ($p = .065$) of DB engagement, but not DF. It therefore appears that the slight imbalance in these traits at baseline may have resulted in slightly higher adherence in the DB condition than might otherwise have been found.

A third variable, self-efficacy, also appeared to be a significant predictor of DB engagement. Although the p value was not statistically significant, the bootstrapped confidence intervals did not cross zero. Also, DB participants with low adherence were significantly lower on self-efficacy than high adherence, $t(47) = -2.04$, $p = .047$.

8.3.6 Long-term sustainability of writing activities and their effects

This section addresses hypotheses 6 and 7, which were:

Hypothesis 6: That even if the writing activities were not continued, improvements in scores on self-report measures of psychological well-being would be maintained for the daily focus group.

Hypothesis 7: That any retention of improvements would not be as strong or as widespread for the daily break group.

As in Study 2, at the end of the study participants were offered the option of continuing their daily writing sessions on a replica webpage. Of 42 DB participants who completed the training, only one continued (for just one more session). Of 46 DF participants who completed the training, four continued, with usage ranging from 3 to 22 further sessions. The pattern was therefore similar to Study 2. To investigate possible differences in longer term changes between groups, a 3 x 2 mixed ANOVA was conducted, with time as the within-participant variable and group as the between-participant variable. The results are shown in Table 8.14 on the next page in order of the significance of the main effect of time.

Eight of the twelve variables showed significant changes over time. As with the T1-T2 analyses in section 8.3.4, the closest to an overall group by time interaction effect was total GOSS. However, this effect was not strong enough to register as a statistically significant T1-T3 Total GOSS change difference between the two groups, $t(64) = -1.48$, BCa 95% CI [-5.97, 0.93], $p = .143$.

Table 8.14 Study 3: Results of 3 x 2 mixed design ANOVAs for T1-T3 changes in self-report measures of psychological well-being

Variable	Main effect of time			Group by time interaction	
	<i>F</i>	<i>p</i>	<i>df</i>	<i>F</i>	<i>p</i>
Negative affect	13.90	<.001	2, 128	1.53	.220 ¹
HADS anxiety	13.77	<.001	1.88, 120.18	1.57	.213 ²
Perceived stress	8.23	<.001	2, 128	1.14	.322
Self-efficacy	7.35	.001	1.90, 114.14	0.02	.973 ^{1,2}
HADS depression	7.50	.001	1.79, 114.76	0.15	.839 ^{1,2}
Total GOSS	7.08	.001	2, 128	2.69	.071 ¹
Optimism	6.45	.002	2, 120	1.71	.186
Positive affect	3.42	.036	2, 128	0.44	.646 ¹
W-BNS relatedness	2.37	.105	1.76, 108.97	1.17	.310 ²
HINT	2.07	.136	1.82, 112.64	0.56	.556 ^{1,2}
W-BNS competence	0.85	.424	1.86, 115.00	0.62	.531 ²
W-BNS autonomy	0.30	.726	1.87, 115.74	0.81	.442 ²

There were no significant main effects of group. ¹ Comparisons made on appropriately transformed variables. ² As recommended by Field (2013), Huynh-Feldt correction used for significant Mauchly's test of sphericity, as Greenhouse-Geisser estimate of sphericity greater than .75.

Group differences were therefore explored in terms of more sensitive paired-samples *t*-tests, as shown in Table 8.15 on the next page, ordered in terms of the significance of DF group changes.

For the DF group, nine out of twelve variables still showed statistically significant improvements at T3. Thus, hypothesis 6 was supported. For the DB group, one variable was still showing a significant improvement at T3 and a further four were approaching significance. Hypothesis 7 was therefore partially supported in the sense that there was more widespread retention of improvements for the DF group (i.e., statistically significant within-group T1-T3 differences). However, the effects were not strong enough to generate significant between-group differences.

(N.B. The mean scores at T1 and T3 were based on just those participants who completed the six-month follow-up. Randomisation checks were therefore also run on the T1 scores for this selection of participants and the only statistically significant difference found between groups was for COPE item 19 ($U = 322.50$, $p = .023$), already addressed above.)

Table 8.15 Study 3: Results of paired-samples t-tests for T1-T3 changes in self-report measures of psychological well-being by group

Variable	Daily break				Daily focus			
	T1	T3	<i>t</i>	<i>p</i>	T1	T3	<i>t</i>	<i>p</i>
Negative affect	2.55 (0.95)	2.28 (0.82)	1.90	.066	2.64 (0.78)	2.09 (0.70)	4.33	<.001 ^{1,2}
HADS anxiety	16.03 (4.12)	14.56 (4.06)	2.11	.043	17.56 (4.55)	14.53 (3.75)	3.87	.001 ²
Self-efficacy	29.59 (4.40)	30.26 (3.76)	-1.99	.055	28.46 (3.69)	29.18 (4.11)	-3.33	.003 ^{1,4}
Perceived stress	32.94 (8.15)	31.38 (6.10)	1.33	.193	34.81 (6.09)	31.00 (6.79)	2.99	.005 ²
Total GOSS	-1.53 (6.98)	-0.88 (7.42)	-0.45	.653	-3.16 (7.36)	0.13 (7.33)	-2.66	.012 ^{1,2}
Positive affect	2.73 (0.88)	2.86 (0.79)	-0.93	.359	2.67 (0.66)	2.96 (0.65)	-2.50	.018 ^{1,2}
Optimism	14.38 (5.74)	15.74 (5.34)	-1.82	.078	12.93 (5.06)	14.64 (6.15)	-2.47	.020 ⁴
W-BNS relatedness	19.35 (5.82)	19.59 (5.59)	-0.34	.735	18.30 (5.11)	19.87 (5.65)	-2.29	.030 ³
HADS depression	12.85 (3.59)	11.71 (3.10)	1.72	.094	12.59 (3.83)	11.31 (3.70)	2.12	.042 ^{1,2}
HINT	43.32 (10.31)	42.32 (9.69)	0.53	.599	46.13 (9.56)	42.43 (11.89)	1.39	.174 ^{1,3}
W-BNS autonomy	18.44 (4.15)	17.65 (4.32)	1.20	.238	16.93 (3.24)	17.23 (4.73)	-0.49	.629 ³
W-BNS competence	21.79 (5.10)	22.71 (4.37)	-1.46	.154	22.17 (5.40)	22.47 (5.40)	-0.41	.689 ³

¹ Raw means (\pm SD) shown, but comparisons made on appropriately transformed data.

Degrees of freedom were 33 for all DB participants; for DF participants, they were either 31 (marked ²), 29 (marked ³) or 27 (marked ⁴). T3 values in bold indicate improvement on T2, though T2-T3 differences were not statistically significant.

As significant group x adherence interaction effects had been found for T1-T2, the impact of adherence was also examined over the longer term follow-up using 3 x 2 x 2 mixed design ANOVAs, with time as the within-participant variable and writing group and adherence as between-participant variables. The results are shown in Table 8.16 on the next page in order of the significance of the interaction.

Table 8.16 Study 3: Group by adherence interaction effects for T1-T2-T3 changes in self-report measures of psychological well-being

Variable	<i>df</i>	<i>F</i>	<i>p</i>
Perceived stress	2, 124	5.35	.006
W-BNS competence	1.82, 109.40	3.14	.052 ²
Negative affect	2, 124	2.70	.071 ¹
Positive affect	2, 124	1.75	.178 ¹
HADS anxiety	1.91, 118.65	1.41	.247 ²
HADS depression	1.82, 112.58	1.31	.272 ^{1,2}
Self-efficacy	1.96, 113.87	0.71	.490 ^{1,2}
Total GOSS	2, 124	0.66	.518 ¹
HINT	1.88, 113.06	0.32	.712 ^{1,2}
Optimism	2, 116	0.32	.727
W-BNS autonomy	1.93, 115.86	0.08	.918 ²
W-BNS relatedness	1.81, 108.50	0.03	.959 ²

¹ Comparisons made on appropriately transformed data.

² As recommended by Field (2013), Huynh-Feldt correction used for significant Mauchly's test of sphericity, as Greenhouse-Geisser estimate of sphericity greater than .75.

There was a significant group by adherence interaction effect for perceived stress, with W-BNS competence and negative affect also approaching significance. The effects for perceived stress are illustrated in Figures 8.4 and 8.5 below.

Figure 8.4 Study 3: T1-T2-T3 changes in perceived stress for daily break group

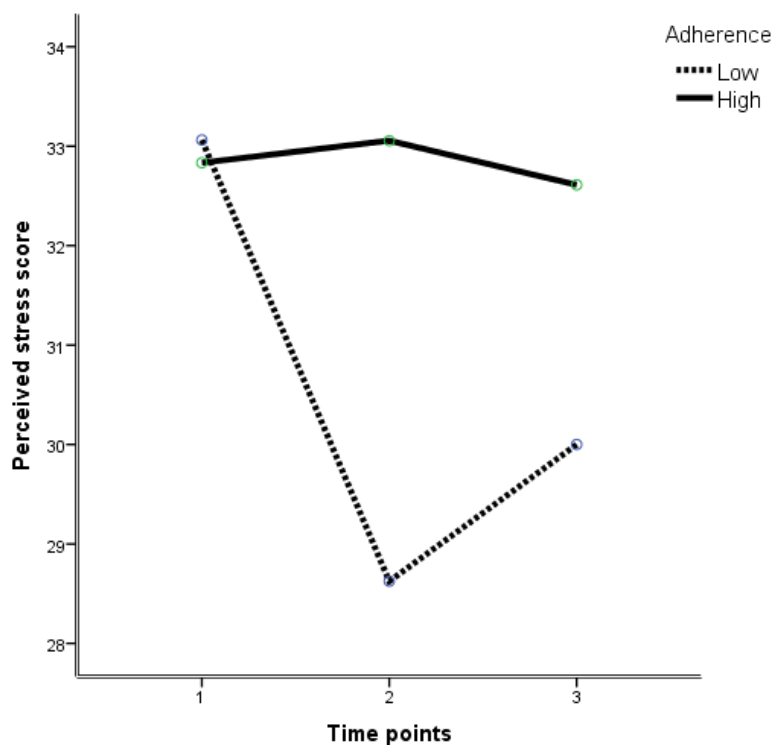
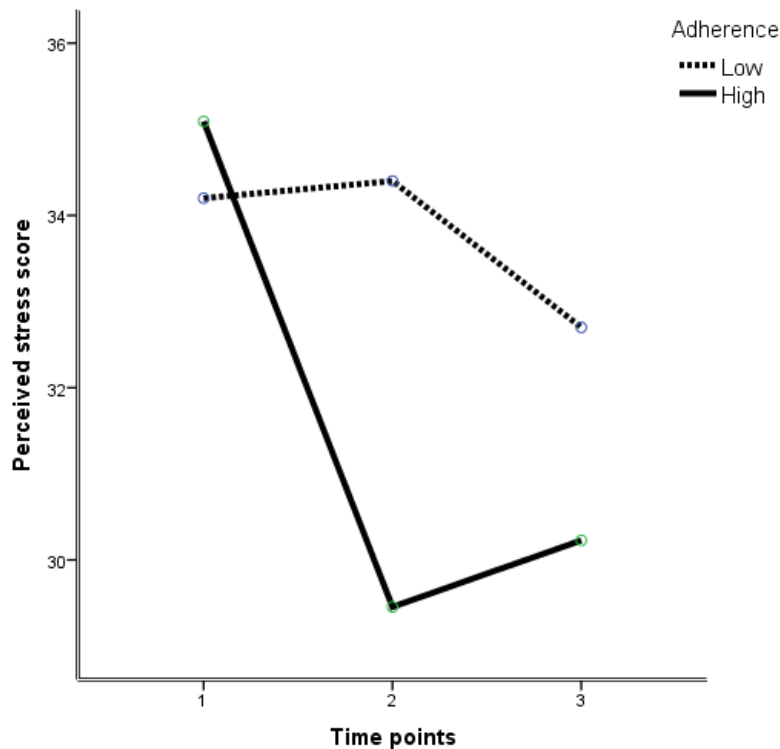


Figure 8.5 Study 3: T1-T2-T3 changes in perceived stress for daily focus group



As before, the stress reductions were most marked for low adherence in the DB group and high adherence in the DF group. At six months, there was still some retention of these improvements. The T1-T3 difference was significant for DF participants with high adherence, $t(21) = 2.88$, BCa 95% CI [1.65, 8.15], $p = .009$, but not for DB participants with low adherence, $t(15) = 1.65$, BCa 95% CI [-0.56, 6.81], $p = .120$.

8.3.7 Cortisol results

Of the 101 participants who completed questionnaire 1, 47 volunteered for cortisol assessment. Table 8.17 on the next page shows the pattern of attrition for cortisol data collection and analysis. The greatest source of data loss was due to sample timing inconsistencies, which tended to result in irregular CAR patterns, i.e., decreases from awakening to plus 30 minutes, rather than increases or no change.

Randomisation checks were rerun on the 27 participants whose data was used to test the hypotheses. There were no significant group differences for sociodemographic variables, adherence, coping style, outcome expectations or any of the pre-intervention cortisol measures. The only significant difference found was T1 negative affect, with the mean (\pm SD) for DF participants, 2.89 ± 0.64 and for DB participants, 2.32 ± 0.79 : $t(18.48) = -2.24$, $p = .037$. This was not correlated with any T1-T2 cortisol changes and so no adjustments to analyses were made.

Table 8.17 Study 3: Cortisol data collection and analysis by group

Process step	Daily break	Daily focus	Total
Collected sampling kits	22	25	47
<i>(Withdrew)</i>	<i>(2)</i>	<i>(2)</i>	<i>(4)</i>
<i>(Non-reply)</i>		<i>(1)</i>	<i>(1)</i>
<i>(Insufficient saliva)</i>	<i>(1)</i>		<i>(1)</i>
<i>(Incomplete sampling)</i>		<i>(2)</i>	<i>(2)</i>
Assayed	19	20	39
<i>(Sample timing problems)</i>	<i>(5)</i>	<i>(2)</i>	<i>(7)</i>
<i>(Irregular CAR patterns)</i>	<i>(1)</i>	<i>(1)</i>	<i>(2)</i>
<i>(Insufficient readings)</i>	<i>(1)</i>	<i>(2)</i>	<i>(3)</i>
CAR analyses	12	15	27
<i>(Insufficient readings)</i>	<i>(3)</i>		<i>(3)</i>
AUC _G and slope analyses	9	15	24

The hypotheses tested were as follows:

Hypothesis 8: That the daily focus intervention would be associated with reductions in cortisol levels between T1 and T2.

Hypothesis 9: That any cortisol reduction in the daily break condition would be less than in the daily focus condition.

Hypothesis 10: That greater engagement (measured in terms of the number of completed writing sessions) would be associated with greater reductions in cortisol levels and greater differences between the two writing conditions.

Each hypothesis was tested with respect to the cortisol awakening response (CAR), duration-corrected version of total area under the curve with respect to ground (AUC_G) and two diurnal slope measures.

To examine T1-T2 changes and possible group by time interactions, 2 x 2 mixed ANOVAs were run with time as the within-participant variable and intervention group as the between-participant variable. The results are shown in Table 8.18 on the next page.

Table 8.18 Study 3: Results of 2 x 2 mixed design ANOVAs for T1-T2 changes in cortisol measures

Variable	Main effect of time			Group by time interaction		
	<i>F</i>	<i>df</i>	<i>p</i>	<i>F</i>	<i>df</i>	<i>p</i>
CAR	0.48	1, 25	.497	0.76	1, 25	.393 ¹
AUC _G	0.63	1, 22	.435	0.03	1, 22	.868 ¹
Slope 2-3	0.10	1, 22	.754	0.08	1, 22	.781 ¹
Slope 1-3	0.001	1, 22	.982	0.01	1, 22	.916 ¹

¹ Comparisons made on appropriately transformed data.

They show that there were no statistically significant changes over time and no significant group by time interactions. Looking in more detail at the paired-samples *t*-tests in Table 8.19 below, again no changes were close to statistical significance.

Table 8.19 Study 3: Results of paired-samples *t*-tests for T1-T2 changes in cortisol measures by group

Variable	Daily break				Daily focus			
	T1	T2	<i>t</i>	<i>p</i>	T1	T2	<i>t</i>	<i>p</i>
CAR	4.50 (3.17)	5.63 (4.11)	-1.59	.140 ³	5.77 (4.03)	5.44 (3.15)	0.11	.912 ^{1,2}
AUC _G	6344.76 (1912.70)	6128.98 (2099.65)	0.67	.523 ⁴	7115.27 (1973.57)	7048.75 (2867.13)	0.67	.513 ^{1,2}
Slope 2-3	-.024 (.008)	-.023 (.006)	-0.04	.969 ⁴	-.030 (.008)	-.029 (.012)	-0.41	.685 ^{1,2}
Slope 1-3	-.014 (.006)	-.014 (.007)	0.10	.922 ⁴	-.017 (.008)	-.017 (.009)	0.06	.951 ^{1,2}

¹ Raw means (\pm SD) shown, but comparisons made on appropriately transformed data.

² *df* = 14; ³ *df* = 11; ⁴ *df* = 8. Units for CAR and AUC_G = nmol/L.

Hence, hypotheses 8 and 9 were not supported. Furthermore, no significant differences were found when tests were rerun split by gender. (N.B. There were also no significant differences in results for comparisons based on non duration-corrected versions of AUC_G.)

To test hypothesis 10, a Pearson product moment correlation matrix was produced, comparing the number of writing sessions with T1-T2 cortisol changes. The results are shown in Table 8.20 on the next page.

Table 8.20 Study 3: Correlations between writing sessions and T1-T2 cortisol change scores by group

Variable	Daily break			Daily focus		
	<i>r</i>	<i>p</i>	95% BCa CI	<i>r</i>	<i>p</i>	95% BCa CI
CAR	-.30	.345	-.84, .56	.24	.384	-.39, .79
AUC _G	.001	.997	-.44, .65	-.002	.995	-.72, .84
Slope 2-3	.10	.791	-.80, .94	.24	.386	-.19, .61
Slope 1-3	.04	.928	-.73, .63	-.06	.830	-.65, .37

As there were no significant correlations, hypothesis 10 was not supported. The only significant results found were correlations between the pre-intervention levels of duration-corrected total cortisol over the day (AUC_G) and engagement (number of writing sessions). The figures were $r = -.86$, 95% BCa CI $[-.98, -.75]$, $p = .003$ for DB and $r = -.68$, 95% BCa CI $[-.87, -.38]$, $p = .005$ for DF. The combined (DB plus DF) figure was $r = -.68$, 95% BCa CI $[-.81, -.50]$, $p < .001$. These results could be spurious, but if correct would suggest that for both interventions, the greater the initial levels of stress hormones, the less effort participants put into the interventions.

8.3.8 Qualitative feedback

Participant responses to open questions in Questionnaire 2 were reviewed for possible insights that might help explain the pattern of results for each intervention.

8.3.8.1 Daily focus – Goal momentum

For the DF intervention, benefits tended to be positively correlated with engagement and the first group of quotations below illustrate sources of benefits reported by high adherence participants:

I found it useful to structure my day into essential unavoidable tasks, fun tasks and tasks from my 'to do' list. Usually I would cram as much as I can into my day and feel at a loss of time and energy. My days turned more planned and my head stopped spinning around an unachievable to do list. [P247; 9 sessions]

I found the training has in a very short time helped me to achieve some things that had been dragging on for ages without being resolved. Just the general use of writing things down stopped me being able to 'get out' of doing things that I may not have enjoyed. The best idea was to prioritise in order of tough but necessary things first, and rewarding yourself after achieving these things. [P210; 7 sessions]

I think it's helped me to get things in perspective when I have a lot of tasks mounting up and to become less stressed about dealing with them. [P216; 7 sessions]

Identifying tasks which need to be done, and breaking them down into smaller chunks has made it easier to complete them. This isn't rocket science, but being required to do it for the study provided the evidence to me that worked. [P317; 7 sessions]

It's helped me see things in a slightly different (more positive) light. It's made me feel I have a little more control of some things. [P236; 5 sessions]

The idea that you try to stop & think & stay calm before reacting - the "adult response" rather than the initial "impulsive" reaction is helping with me with my son and with difficult work colleagues. [P278; 5 sessions]

These high adherence participants had all been able to make good use of the techniques. Low adherence participants, however, tended to be blocked in various ways:

I found it hard to absorb the quantity of information, advice and steps and how the "system" (training) would work. The training was not quite concise enough for me to be able to do at work. In a busy open plan hot desk office I found it almost impossible to contemplate personal matters like this. [P219; 3 sessions]

Where it was not useful, it relies heavily on self knowledge and working out for yourself where you are thinking negatively. I could do with someone, e.g., a peer or counsellor to tell me and reflect back how I am behaving sometimes. [P286; 3 sessions]

It felt like an added stress to have to do something extra each day. It felt like a bit of a chore and made me think more about my problems (I usually tend to try and suppress them which I know doesn't help). [P275; 3 sessions]

8.3.8.2 Daily break – Goal-state substitution

The inverse relationship between engagement and benefits for the DB intervention is harder to explain, as there appeared to be no clear pattern in the comments. Benefits were reported by both low and high adherence participants, as indicated by the quotations below:

Most useful - imagining a situation or past event and writing about it. Took thoughts away to better times, prompting nicer feelings. [P261; 2 sessions]

To refocus the mind and have a much clearer head. [P292; 3 sessions]

The instant distraction of accessing pleasant memories is a very good exercise. Also, the listing things alphabetically was fun because I could think of things I enjoyed thinking about, stuff I'm interested in, not stuff I have to think about but don't want to-

life's boring responsibilities, work, etc. I somehow don't allow myself to do that enough during the day. [P224; 6 sessions]

Highlighted the need to interrupt thoughts and do something pleasant to "cleanse" brain/emotions so that problems/worries can be dealt with from a more neutral position. [P263; 7 sessions]

I have really enjoyed having the excuse to take time out and write, which is something that I have always enjoyed doing. [P232; 7 sessions]

Again, limitations were reported by both high and low participants:

The training seemed to be based on distraction from stressful situations, rather than looking at ways of dealing with the situation itself. This was useful briefly, but I don't feel it made any lasting or longer term difference. [P289; 3 sessions]

The problem I am facing is a major one, so not quite sure what would help. [P314; 4 sessions]

...it doesn't relate to real life issues and difficulties. You can day dream but can't get away from harsh realities. [P217; 5 sessions]

The creative writing exercise, whilst helpful, was in some ways comparable to a very stressful time at work insofar as my very busy times usually involve writing long reports (I find that particular part of my work enjoyable but find it difficult and stressful to balance alongside other demands). [P296; 6 sessions]

I found it difficult to think of things to write about and I felt more stressed that there was an extra thing I had to fit in each day. I also found that even though I was trying to think of nice memories to write about my mind would try to find something within that memory to make me feel sad. [P234; 7 sessions]

8.3.8.3 General limitations

Apart from limitations specific to each type of training, a more general problem, cited by many participants as a reason for not engaging with the training, was lack of time or pressure of work, as illustrated below:

Lack of time / forgetting to do the training. [P295; 2 DF sessions]

I felt I couldn't give this study/training my full attention as work got in the way. [P287; 2 DB sessions]

The situation with regard to IT changes, end of financial year and new staff joining the team did not help and added to my stress which made me less inclined to do the study, both from a time and mental capacity point of view. [P219; 3 DF sessions]

I was under too much pressure to put enough time into it. [P238; 4 DF sessions]

8.4 Discussion

8.4.1 Summary of key findings

Ten hypotheses were tested:

Hypothesis 1 predicted that both DB and DF interventions would be associated with positive changes in scores on self-report measures of psychological well-being between T1 and T2. For both groups, most variables changed in a positive direction, with three of the changes statistically significant for DB (negative affect, anxiety and depression) and six significant for DF (negative affect, total goal status, anxiety, optimism, perceived stress and depression). Thus, the first hypothesis was supported.

Hypothesis 2 predicted that the DF intervention would be associated with stronger or more widespread improvements, with total GOSS changes differing most between interventions. The first part was supported, by the greater number of significant DF improvements highlighted under hypothesis 1. The second part of the hypothesis relating to total GOSS was not supported, as the result was not statistically significant. However, as it was the closest to a significant group by time interaction, it might be useful to retest the hypothesis with a larger sample.

Hypothesis 3 predicted that greater engagement in terms of the number of writing sessions would be associated with greater improvements in scores on self-report measures of psychological well-being. Though only two (perceived stress and HINT) out of twelve correlations were significant, the general pattern of positive correlations appeared to support the hypothesis with respect to DF. It was not supported, however, for DB, where the trend appeared to be in the opposite direction.

Hypothesis 4 predicted that, as in Study 2, the number of DF writing sessions would be positively correlated with outcome expectations, consideration of future consequences and conscientiousness. The hypothesis was not supported.

Hypothesis 5 predicted that the number of DB writing sessions would be positively correlated with outcome expectations and conscientiousness, and negatively correlated with consideration of future consequences. The hypothesis was not supported. However, when the DB and DF groups were combined, the hypothesis was supported with respect to outcome expectations.

Hypothesis 6 predicted that improvements in self-report measures of well-being would be maintained for the DF intervention at the six-month follow-up. This was supported to the extent that nine out of twelve variables showed statistically significant T1-T3 improvements.

Hypothesis 7 predicted that any retention of improvements at six months would not be as strong or as widespread for the DB intervention. This was supported in terms of being less widespread for the DB group, as only one variable (HADS anxiety) showed a significant improvement at T3, compared to nine for the DF group.

Hypothesis 8 predicted that the DF intervention would be associated with reductions in cortisol levels between T1 and T2. This was not supported.

Hypothesis 9 predicted that any cortisol reduction in the DB condition would be less than in the DF condition. This was not supported.

Hypothesis 10 predicted that greater engagement would be associated with greater reductions in cortisol levels and greater differences between the two writing groups. This was not supported.

8.4.2 Implications

Hypotheses 1 and 2 – T1-T2 improvements

A principal aim of this research was to develop, test and ultimately promote a methodological approach that helps extend and accelerate the accumulation of knowledge on how best to develop self-regulatory skills at a population level. Two key components of this approach are (i) full disclosure of the intervention, and (ii) more comprehensive reporting of results (including non-significant findings). The first should facilitate progress through enabling different researchers to collaborate on the same interventions. The second should enable lessons to be learnt from trends that might be important but not initially statistically significant, given the complexity of processes in the natural world. Furthermore, it is through addressing the weaknesses of interventions that potentially the greatest improvements can be made. Three examples of possibly useful insights gained from reporting and addressing non-significant results are illustrated below:

1. The T1-T4 change in optimism reported in Study 2 was non-significant ($p = .179$). As described in Chapter 7, the end of the tactical intelligence section of the DF intervention was therefore revised to try to encourage more positive daily outcome expectations. In Study 3, the T1-T2 change for optimism was highly significant ($p = .004$) and over a shorter time period. If due to the revisions, this could be interpreted as evidence of how enhancing daily outcome expectations can generate more positive generalized outcome expectancies. If due to some other reason, e.g., the lower starting level of optimism in Study 3, the full disclosure of the intervention facilitates replication by others to test this.

2. The T1-T4 change in HINT reported in Study 2 was not significant ($p = .554$). Again, as described in Chapter 7, the end of the tactical intelligence section of the DF intervention was revised to try to limit habitual rumination. In Study 3, the T1-T2 change was still not significant ($p = .138$), but it was closer to significance than the .554 value in Study 2, despite spanning a shorter time interval. This could just be a spurious result, as for example the DB intervention T1-T2 change p value was even lower ($p = .105$). However, the significant correlation between DF writing sessions and HINT reduction ($r = -.35, p = .016$) and not for DB ($r = -.07, p = .670$) strengthens the possibility that the HINT reduction stemmed from participants following the revised TI instructions (see section 7.3.3). Again, full disclosure of the intervention and changes made enables others to try to replicate and build on these findings.
3. In Study 2, the T1-T4 changes for W-BNS competence and relatedness were significant (.001 and .003, respectively), but not for autonomy ($p = .579$). Again, as described in Chapter 7, the DF training guidance notes were revised to try to emphasize opportunities for autonomy and control. In Study 3, however, not only was the change in autonomy far from significant ($p = .440$), but the changes in competence and relatedness were also far from significant (.738 and .534, respectively). A possible explanation is that improvements in these measures may take time to materialise. In Study 2, they were measured over a six week interval, as opposed to two weeks in Study 3. The baseline levels for autonomy and competence were similar in Studies 2 and 3, but much higher for relatedness in Study 3. The T1-T3 change for relatedness, based on a smaller subgroup of participants and a lower T1 mean, showed a significant change ($p = .030$). Changes for autonomy and competence were still far from significant however. This suggests that autonomy enhancement still needs further work. For competence, potential effects may have been weakened by an element of regression towards the mean, as the baseline DF measure was higher than the DB baseline. Again, replication would be useful here.

A final point that might help explain the pattern of results outlined above, is that the improvements in optimism and HINT scores were associated with changes at the end of the daily focus TI section that participants would normally read each day, whereas the revisions relating to autonomy were confined to the DF training guidance notes, which were normally read just once. Hence, the sequencing of information/instructions is also an important consideration for future intervention design.

With respect to hypothesis 2, Table 8.21 below shows effect sizes for the significant T1-T2 daily focus changes in comparison with the T1-T2 daily break effect sizes and Study 2 effect sizes.

Table 8.21 Comparison of effect sizes (Cohen's *d*) across Studies 2 and 3

Variable	Study 3 T1-T2		Study 2 T1-T2	
	Daily break	Daily focus	Per-protocol	Intention-to-treat
Negative affect	0.42**	0.55***	0.39*	0.15 ^{ns}
Total GOSS	-0.17 ^{ns}	-0.43**	-0.71**	-0.37 ^{ns}
Perceived stress	0.22 ^{ns}	0.37**	0.34*	0.14 ^{ns}
HADS anxiety	0.29**	0.36**	0.48**	0.29 ^{ns}
HADS depression	0.37**	0.26*	0.29 ^{ns}	0.10 ^{ns}
Optimism	-0.05 ^{ns}	-0.24**	-	-

^{ns} = not significant, * = $p < .05$, ** = $p < .01$, *** = $p < .001$.

Most of the effect sizes shown for Study 3 were in the small to medium range, according to Cohen's (1988, 1992) assessment criteria. Overall, there was no clear differentiation between the DB and DF effect sizes, as evidenced by the lack of a statistically significant group by time interaction (see Table 8.10). However, some variables showed greater differentiation than others (e.g., total GOSS and optimism), which suggested that it might be worthwhile repeating such analyses in a larger, more powerful study.

The effect sizes reported for Study 3 are not directly comparable to those reported in, for example, Richardson & Rothstein's (2008) meta-analysis cited in Chapter 2, as calculations for the latter were based on between-groups comparison (experimental versus control), whereas the figures in Table 8.21 are based on within-group comparisons. Between-group effect sizes could be calculated using the method suggested by Becker (1988), of subtracting the within-group effect size of one condition from the other. However, as both DB and DF interventions yielded improvements in the same direction, the effect sizes calculated would be much smaller than those generated in comparison with neutral controls.

A further implication of the improvements found for both interventions is that it is possible that they may have stemmed at least in part from simply participating in a research study, e.g., through temporarily raising expectations or some form of Hawthorne effect (e.g., McCambridge, Witton, & Elbourne, 2014). Thus, for example, even if there were little of enduring value in the daily break techniques, judicious presentation of the few significant results juxtaposed against a wait-list control, might

have secured publication and an ‘evidence base’ in support of the intervention. This underlines the importance of testing interventions against other interventions in similar formats and contexts, as in this study, to try to control for such extraneous influences.

The effect sizes are not directly comparable between Studies 2 and 3, as T1-T2 covered one week for the former and two weeks for the latter. Hence, it would be useful to establish a consistent pattern of timing across studies. The difference between per-protocol and intention-to-treat effect sizes also highlights the importance of specifying on what basis the results were calculated.

Hypothesis 3 – Correlations between writing sessions and T1-T2 changes

In Study 2, the only significant correlation was with self-efficacy change ($r = .45$, $p = .026$). In Study 3 (for DF), only changes in perceived stress ($r = -.41$, $p = .005$) and HINT ($r = -.35$, $p = .016$) were significantly correlated with the number of writing sessions. The correlation for self-efficacy was far from statistically significant ($r = .20$, $p = .187$). A possible explanation is that as change is a dynamic process, the rate of change in different measures may vary across time and participant groupings. This is likely to make meaningful mediation analysis difficult, unless a clear pattern emerges across studies.

The overall pattern of DF results, however, suggests that the greater the engagement, the greater the improvement. The relatively poor outcomes for low adherence DF participants, reported in section 8.3.4, suggest a minimum engagement threshold for effectiveness. This could mean that the DF intervention should generate improvements in psychological well-being wherever participants can be persuaded to make the necessary effort. Alternatively, there could be an issue of incompatibility within the low adherence grouping of participants, which reinforces the importance of investigating person and environment factors influencing adherence, as in hypothesis 4.

The inverse pattern of correlations for DB was unexpected. It would appear to suggest that the DB intervention was only beneficial if used lightly. However, again it could be a question of individual compatibility, which is discussed in the next section.

Hypotheses 4 and 5 – Predictors of DF and DB engagement

Based on the results of Study 2, consideration of future consequences had been identified as a possible predictor of participant engagement in the writing sessions, i.e., type 2 goal-related activities. However, in Study 3 there was no evidence of such a relationship between CFC and writing sessions. One possible explanation is that the significant correlation found in Study 2 was just a chance event, i.e., Type I error, which highlights the importance of replication.

Another possible explanation relates to Bhaskar's (1979) ontological domains, discussed in Chapter 1, and the fact that though many causal mechanisms exist in the natural world, they may not be activated or come to the fore in all situations. Thus, for example, as the intervention in Study 3 was much shorter than in Study 2, there may not have been adequate time or enough writing sessions for the possible influence of CFC to play out. This again highlights the importance of keeping track of variables of interest across different studies and reporting the results even if not statistically significant.

The new predictors that appeared to be significant in Study 3, i.e., extraversion for DF and openness to experience and self-efficacy for DB, discussed above, could also be spurious and so again would need to be tracked across studies and also perhaps tested with better measures.

If extraversion is genuinely correlated with DF engagement, this could perhaps help account for the better outcomes of high versus low adherence, if for example higher adherence/extraversion results in participants being more likely to turn their DF plans into action in the real world.

Similarly, if openness to experience and self-efficacy are genuinely correlated with DB engagement, they could perhaps help explain why high adherence was associated with poorer outcomes. It is possible, for example, that highly curious and capable/resourceful participants may have found the intervention disappointing or insufficiently challenging. This is illustrated, for example, by the comment below from a high adherence DB participant:

... it doesn't relate to real life issues and difficulties. You can day dream but can't get away from harsh realities. [P217; 5 sessions]

Hypotheses 6 and 7 – Retention of improvements at six-month follow-up

As with Study 2, DF benefits were retained without widespread or prolonged continuation of the online writing sessions. As before, it was possible that many participants were still applying the techniques, but more informally, as illustrated by the quotation below:

I self analyse more, I think about the questions the training asked and use them to help me cope. I continued to do the online questionnaire for a while but now find I can do it by just thinking about it and that helps a lot. [P321; 5 sessions]

This retention of benefits was encouraging given that the intervention for Study 3 was much shorter than for Study 2, i.e., two weeks compared to four to six weeks. A logical next step would be to see if benefits could be maintained with an even shorter DF

intervention. It would also be useful to conduct both six- and twelve-month follow-ups in the same study to see whether effects fade or possibly plateau over time.

For the DB intervention, the fact that only one variable (anxiety), compared to nine for DF, showed significant retention of improvements at six months, suggests the DB coping mechanisms are not as effective over the longer term as the DF mechanisms. This is consistent with the findings of Suls & Fletcher (1985).

Hypotheses 8, 9 and 10 – Intervention effects on cortisol levels

The absence of any statistically significant results could be interpreted as suggesting the interventions had no significant impact on cortisol levels. This is a possibility, but it is also possible that any effects may have been missed due to the low power resulting from the reduced sample size and also poor control over sampling times. As highlighted by Smyth et al. (2013), accurate timing of the first waking sample is crucial and yet difficult to achieve, when determined by participants in their own homes. Accuracy can be improved by devices such as motion-sensitive ‘actigraph’ watches to indicate waking time and capsules with timer lids to indicate time of sampling. However, this was not feasible for this study.

The inverse correlation found between pre-intervention levels of total cortisol over the day (AUC_G) and engagement in the training, could also be a contributing factor towards the failure to detect any significant effects on cortisol, as the most stressed participants, who stood to gain the most, appeared to make the least effort. This was particularly problematic for the DF intervention, where the greater the effort, the greater the improvement. If correct, this could imply that using this type of intervention to help alleviate stress, may not benefit those most in need.

8.4.3 Limitations

There were various limitations to the internal validity of the study. Firstly, the absence of a ‘neutral’ non-intervention condition, such as a wait-list control, meant that it was not possible to rule out the possibility of parallel events within the organisation contributing to the improvements in some way. Having such a third condition would have also enabled the calculation of more conventional effect sizes for each condition. However, restriction to two conditions was a resource issue and the priority of the study had been to explore differences between two types of coping and this at least was achieved.

The fact that a sole researcher (SD) conducted all aspects of the study and hence was not blind to the group allocation, raised the possibility of bias, either conscious or unconscious. The absence of any face-to-face interaction and use of identical emails

for each group limited the potential for biased treatment, but could not rule it out and so researcher blinding would clearly enhance the design of future trials.

Another limitation relates to the type of measures used, i.e., predominantly self-report. As highlighted in Chapter 2, self-report measures are subject to various memory and judgement biases. Also, changes in the scores on the measures could stem from changes in expectations and behaviour resulting simply from the act of participating in an intervention, rather than from the techniques used. In this study, however, though such potential sources of bias were not controlled in an absolute sense, they were in a relative sense, in that both interventions used the same format and measures. Only the techniques differed.

Within the measures themselves, some were less reliable than others. This was particularly the case with the two-item measures, the TIPI and the COPE scales, which tended to have relatively poor internal reliability. Larger scales with more items might have helped address this, though would have added to participant burden. Future studies could use a smaller number of larger scales to focus on issues of specific interest, such as the influence of personality traits.

The reliability of the cortisol measurement was also a key limitation. The absence of any direct interpersonal contact meant that participants' only guidance was from written instructions. With a better resourced study, with for example one or more researchers based on site, it would have been possible to demonstrate the procedures in person. Also, use of the electronic devices mentioned above could have further enhanced accuracy.

There were also key limitations to external validity. As participants were self-selecting volunteers, they were not necessarily representative of the total workforce in terms of openness to psychological interventions. Recruitment was also restricted to employees in job roles with considerable flexibility. The DF intervention in particular might not have been as effective for staff with less control over the nature and pace of their work. A further limitation was the imbalance of males and females, which limited the capacity for exploring possible gender differences.

Finally, the fact that even in a supervised study, over fifty per cent of participants failed to complete more than half of the prescribed sessions, demonstrates that the interventions, at their current stage of development, are inappropriate for widespread use. This would be a problem if they had been intended as end interventions. However, as explained in Chapter 1, this was not the aim. The focus was rather to investigate patterns of response to different types of skills training, to help build an evidence base

for the development of far more powerful self-regulatory interventions. In this context, non-adherence is a useful indicator.

8.5 Conclusion

The aim of the study had been to explore the feasibility of using extended versions of Pennebaker's writing paradigm to test the effects of two contrasting self-regulatory coping strategies. It was able to demonstrate differences between the interventions and showed advantages, both short and longer term, of the daily focus goal-momentum intervention. The study also revealed differing impacts of adherence and highlighted possible differences in individual predisposition towards the two types of intervention. Very different patterns of correlation between Studies 2 and 3 highlighted the complexity of the processes involved and the importance of replication.

The next chapter reviews the research described in this thesis and discusses possible avenues for further development.

CHAPTER 9: THESIS DISCUSSION

This chapter reviews the programme of research undertaken for this thesis, its contribution, limitations and possible avenues for further development.

9.1 Summary of thesis aims and research undertaken

9.1.1 Thesis aims

As outlined in Chapter 1, the primary purpose of this thesis was to explore the feasibility and potential of a particular methodological approach to developing and testing self-regulatory coping skills. The method used was an extension of Pennebaker's writing paradigm. The research questions addressed were whether the extended paradigm could be used to:

1. induce distinctive sets of self-regulatory psychological coping mechanisms;
2. differentiate their effects on psychological and physiological well-being;
3. investigate factors facilitating or impeding the learning, application and maintenance of new self-regulatory coping skills.

9.1.2 Research undertaken

The literature review in Chapter 2 highlighted a range of issues that provided the rationale for seeking to extend Pennebaker's writing paradigm. These included the need for more direct public communication of research insights into stress and coping, limitations of self-report coping measures, strengths and weaknesses of CBSM interventions and Pennebaker's emotional disclosure writing experiments, and possible advantages of exploiting a middle ground between the two.

Chapter 3 set out a multilevel conceptual framework for specifying distinctive sets of self-regulatory coping skills and for designing the content of the core writing intervention developed in this thesis. Chapters 5 and 7 outlined the key changes made at each conceptual/process level to enhance the intervention following each stage of empirical testing. The testing was conducted in Studies 1, 2 and 3, reported in Chapters 4, 6 and 8, respectively.

9.2 Contribution of research

This section outlines the contribution of the research to methodology, theory and knowledge.

9.2.1 Contribution to methodology

The research demonstrated that Pennebaker's experimental writing paradigm can be used for more than investigating the effects of a brief series of emotional disclosure writing tasks. This was illustrated with two distinctive self-regulatory coping

interventions, which highlighted the advantages of the extended writing paradigm in terms of both inputs and outputs of intervention experiments.

In terms of inputs, the advantages apply to the design, execution, ongoing development and replication of interventions. For the design, a key advantage is that as the training is delivered solely by written instructions, the contents of the intervention can be fully specified and reported. As noted by Glasziou et al. (2008), this is relatively rare for behaviour change interventions. This thesis went further, however, and described the multilevel theoretical framework underpinning the intervention. Thus, both the theory and its translation into practice are open to scrutiny by others, which is arguably more useful to the broader research community than just citing an abstract list of behaviour change techniques (BCTs). To use a cooking analogy, though a list of ingredients is helpful, the skill lies in knowing how best to put them together.

A further advantage for design is that the modular structure of the interventions facilitates experimentation and ongoing development, e.g., through the possibility of adding, removing or refining different components, as illustrated in Chapters 5 and 7. Thus, for example, specialists from different fields could focus on components relating to their particular area of expertise without having to reinvent the whole intervention.

In executing interventions, the extended writing paradigm offers greater experimental control and consistency than interventions delivered face-to-face or in groups. This reduces the potential for confounds associated with human interaction, which in turn facilitates replication. It also offers greater experimental control in terms of participant exposure to the 'active ingredients' of interventions, e.g., through daily repetition of set activities.

With respect to experimental outputs, the extended paradigm offers advantages in terms of direct measurement of coping activities (e.g., numbers of writing sessions), as well as the richness of the data collected and opportunities for subsequent analysis. The paradigm offers a real-time record of participants' daily self-regulatory coping efforts, showing their preoccupations, their reactions to events, their causal attributions and possible changes over time. It can also show the training components that they have focused on, what they have retained and how they have applied this and the frequency. This allows for more objective and detailed manipulation checks and exploration of links between coping behaviours and physical and psychological well-being than normally possible with self-report coping inventories. This will be particularly valuable when exploring more subtle distinctions, e.g., between alternative techniques within the same coping category or different ways of teaching and applying the same techniques. The greater detail should also be helpful in establishing qualitative and

quantitative engagement thresholds for intervention effectiveness and sustainability. It can also help to identify weaknesses in interventions (e.g., sources of misunderstanding) or explore individual differences in reactions to interventions, particularly for participants who respond poorly. Also, it may be possible to identify patterns of change in people's thinking/writing over time, for example, using tools such as the Linguistic Inquiry and Word Count software (Pennebaker et al, 2001) mentioned in Chapter 2.

More generally, however, a key practical advantage of this methodological approach is that it enables complete interventions, along with evidence of their strengths and weaknesses, to be made available to the broader research community for collaborative enhancement and ultimately public use.

9.2.2 Contribution to theory

This thesis has not generated any new theories, but has sought to integrate a range of existing theories and models to (a) facilitate the development and testing of complex self-regulatory coping interventions, and (b) help improve public understanding and application of key self-regulatory skills.

The first key aspect of this integration was the use of a multilevel theoretical framework for designing the core intervention. As described in Chapter 3, the framework addressed basic stress-reduction mechanisms, possible enhancement strategies, ways of encouraging the adoption and maintenance of such strategies and how best to communicate this. Separating out the different process levels in this way helped identify multiple avenues for enhancing the overall effectiveness of the intervention. A further benefit of the framework was that the GSFC taxonomy, used to classify the stress-reduction mechanisms, provided more options for differentiating coping strategies than, for example, simple dichotomies such as problem- versus emotion-focused or approach versus avoidance, described in Chapter 2.

The options were further enhanced by the second key element of integration, i.e., combining control theory, upon which the GSFC taxonomy was based, with dual-processing theory, which addressed competition between type 1 and type 2 goal pursuits. This allowed for more elaborate hypothesis testing and potentially more powerful interventions, e.g., by addressing problems such as ego depletion and sustainability issues such as habit formation.

As the constituent models of the GSFC taxonomy were based on the pursuit of multiple rather than single goals, they were more representative of everyday life. A practical advantage was that this helped circumvent the issue of stressor controllability assumed

to determine the appropriateness of problem-focused versus emotion-focused coping strategies. With the goal-momentum strategy, for example, if one goal was uncontrollably blocked, then attention shifted to a second or third, etc.

Emphasis on the underlying goal-related function of coping behaviours not only helped to clarify the design objective for each component of the intervention, but also the underlying purpose of each activity for participants / end-users. Emphasizing underlying self-regulatory functions could also help end-users / the general public better understand the links between seemingly disparate interventions such as anger management, assertiveness training, CBT, mindfulness, problem solving, gratitude exercises and benefit finding. Where interventions are self-administered, it is particularly important that the concepts used are easy to understand and apply. The ‘three intelligences’, for example, devised in Chapter 3, appeared to be easy to understand, but not necessarily to apply and hence better ways of presenting these self-regulatory skills and behaviours may need to be found.

9.2.3 Contribution to knowledge

As highlighted by the discussion of the post-positivist position in Chapter 1, it is difficult to derive clear-cut answers from field experiments involving multifaceted interventions. Thus, the three studies in this thesis only offer partial and tentative insights into the complex processes involved.

Study 1 was principally qualitative and highlighted a number of important issues for intervention design. One was the challenge of achieving the right balance between ease of use and breadth and depth of content; a balance which, as the study demonstrated, differs from individual to individual, and where mismatched could undermine rather than enhance well-being. This reinforces the point made in section 9.2.1 about successful intervention design requiring more than simply choosing items from a list of behaviour change techniques.

An issue highlighted regarding the SI component of the intervention was the relatively artificial nature of the goal-setting tasks and the difficulty in getting participants to set alternative goals to which they could genuinely commit. A key issue regarding the PI component was how to help participants effectively challenge their own thought processes. For the TI component, a key issue was how to help overcome competing impulsive drives. Strategies for addressing these were outlined in Chapters 5 and 7.

The contribution to knowledge from Study 2 was limited by the experimental design. However, it appeared to show that a relatively complex online self-regulatory writing intervention, requiring relatively little time or resources, was capable of generating

improvements across a range of measures of psychological well-being, which were sustained over the course of a year. As noted in Chapter 6, the effects appeared stronger and more durable than typically found for emotional disclosure writing interventions. Poorer performance for some variables (e.g., HINT, autonomy, optimism) highlighted areas for possible improvement. Importantly for the underlying theory, the study also appeared to support the dual-process goal-momentum model in that participants who were future oriented in their thinking engaged more in the training.

Study 3 showed that the DF goal-focused writing intervention appeared to generate more comprehensive and sustained improvements in self-reported psychological well-being than the DB emotion-focused intervention. It also showed that the two interventions appeared to have contrasting effort-reward relationships. Furthermore, changes to the DF intervention between Studies 2 and 3 also illustrated possible effects of subtle changes to intervention components and their positioning, as well as the value of tracking patterns of non-significant results across studies. The latter is particularly important given the multiplicity and complexity of causal mechanisms and the possibly, as found, that significant predictors in one study may not be significant in the next.

9.3 Limitations

This section outlines limitations relating to the internal and external validity of the research.

9.3.1 Internal validity

In view of the complexity of the processes involved and the contexts in which they were investigated, there were many potential threats to internal validity. Two key sources of threat were inaccuracy of measurement and control of possible confounding variables.

With respect to measurement, the challenge largely stemmed from the fact that the majority of variables under investigation (i.e., psychological processes and states) were not directly observable. The research, therefore, principally relied on indirect self-report measures, which as noted in Chapter 2 are vulnerable to various sources of inaccuracy and bias. The vulnerability differs from scale to scale, depending on the demands made on memory and judgment. Thus, for example, ratings of personal autonomy, which as discussed in Chapter 7 depend on one's frame of reference, were potentially more problematic than relatively simple mood measures.

Reliance on established validated scales, though recommended practice, may in some cases have exacerbated the problem, as 'off-the-shelf' items may not have precisely matched the focus of the interventions. Thus, more customised measures (e.g., for

personal autonomy or thinking preferences) may be required to detect particularly subtle effects.

As demonstrated in this thesis, however, the extended writing paradigm offers opportunities for more objective behavioural measures, such as using the number of writing sessions to assess adherence, or the content to check the experimental manipulation. However, though the contents of the writing sessions offer more detailed and direct insights into participants' coping activities than self-report coping inventories, they are still only limited proxy measures. They offer just a partial record of participants' coping activities during their brief daily writing sessions. They do not capture their actual coping efforts across the day. This could be addressed to some extent, for example, by incorporating questions about prior day coping efforts. But this again would be subject to memory and perceptual biases. Also, although the extent of the impact was unclear, the fact that participants' writing sessions were viewable by a researcher (SD) may have influenced their content, and hence they may not necessarily have been truly naturalistic representations of participants' daily thought processes. Nevertheless, at the very least the writing sessions provided useful insights into individual differences in patterns of responding to the various training activities.

A further type of measurement used, physiological measures, might be considered more objective and hence less prone to error, but this is not necessarily correct. Though measurement of the stress hormone cortisol in saliva has a number of advantages, it also poses particular challenges. Advantages include the fact that it is non-invasive and that cortisol levels are not impacted by saliva flow rate (Kirschbaum & Hellhammer, 1989). A key challenge, however, is that cortisol levels are not only affected by stress, but also by the daily sleep-wake cycle (Hucklebridge, Clow, Rahman, & Evans, 2000) and thus accurate timing of sampling in relation to waking is essential. In Study 3, participant waking and sampling times were self-reported with no objective verification. Hence, any future studies would need to be more tightly controlled.

With respect to control of IVs and possible confounds, self-report measures, as stated in section 7.6.2.1, are particularly vulnerable to placebo effects and other sources of bias, such as demand characteristics (e.g., Orne, 1962). An RCT design, as used in Study 3, addresses this to some extent, but the design of the control condition is critical. Ideally one would want the control to show what would have happened to an identical group in the same context without the intervention. However, as the simple act of measurement can influence behaviour (e.g., French & Sutton, 2010) and even wait-list controls have sometimes shown significant improvements (e.g., Zetterqvist, Maanmies, Ström, & Andersson, 2003), a truly neutral control appears difficult to

achieve. Furthermore, a control will not control for possible placebo effects if participants deduce that it is a control condition. Any effect size calculated in such a situation compared to the control could therefore be inflated.

The approach adopted for Study 3 was to try to avoid problems relating to the uncertain neutrality of a control, by using two experimental conditions, designed to differ principally in just their core self-regulatory mechanisms. The study demonstrated the relative advantages of DF over DB, but the effects for both could have included an element of a placebo effect or been influenced by parallel events occurring within the organisation. Having additional controls, e.g., a wait-list group or a 'neutral' control, could have provided more answers, but would have required more resources.

The behavioural measures could also have been subject to various confounds, e.g., Hawthorne effect (e.g., McCambridge et al., 2014), but this would hopefully have applied equally to both conditions. The physiological measures were also vulnerable to numerous confounds, as cortisol levels can be affected by many factors other than psychological stress, e.g., diet, smoking, coffee and alcohol consumption, sex hormones and various medications (Kudielka, Hellhammer, & Wüst, 2009). In Study 3, controlling for such variables relied on self-report. With more resources, tighter controls and more objective verification would have been possible. Also, with more resources and researchers, researcher blinding could have been included to guard against possible experimenter effects (e.g., Rosenthal, 1964).

Finally, even with more precise measures and tighter controls, as highlighted by Bhaskar's (1979) ontological domains, certain causal mechanisms may only come into play in certain circumstances and so replication is particularly important in this field of research.

9.3.2 External validity

9.3.2.1 Ecological validity

The ecological validity of the research was relatively high compared to, for example, laboratory-based stress testing. The stressors addressed were real-life stressors identified by the participants and the interventions involved them applying self-regulatory techniques on their own in their everyday environments. This was not, however, completely representative of everyday experience in that it was part of a research study, which may have affected certain outcomes such as dropout rates. As noted, for example, by Richards & Richardson (2012) cited in Chapter 2, administrative (non-therapeutic) support, as provided in Studies 1 to 3, is associated with much lower dropout rates than unsupported use of online training materials. This might also partly

explain why so few participants continued their online writing sessions beyond the end of each study.

9.3.2.2 Population validity

There are also limitations in the extent to which the study findings might generalize to wider groups of people and contexts. The samples in the three studies were self-selecting and therefore not necessarily representative of the wider workforce. They may, for example, have been above average in curiosity, openness to new experience or propensity to seek help. Due to the nature of their work, they may have had above average literacy skills, which would naturally facilitate writing-based interventions.

The investigation of possible moderators of engagement within this thesis explicitly acknowledges that the interventions are unlikely to be universally effective. However, rather than a limitation of the research, this is a justification for more research of this nature to identify person- and environment-related factors moderating outcomes, so that ultimately interventions can be better tailored to individual needs.

9.4 Key issues/questions and possible future research directions

Further research questions are addressed under the process level headings set out in Chapter 3 and applied throughout this thesis. This is just one way, however, of structuring the design process. With ever growing lists of behaviour change techniques (e.g., Abraham & Michie, 2008; Michie et al., 2013), behaviour change theoretical domains (e.g., Cane, O'Connor, & Michie, 2012) and implementation models (e.g., Tabak, Khoong, Chambers, & Brownson, 2012), there are many other possible formats. A challenge for future research will be to find optimal ways of structuring such information.

9.4.1 Stress-reduction / self-regulation processes

As already highlighted, the interventions in this thesis have been framed as stress-management interventions, but the core focus has been on self-regulation. The latter is a much broader concept, which includes the generation of positive states as well as the reduction of negative states. A key avenue for further research would therefore be to explore how people respond to interventions with a more explicit self-regulatory focus. A preliminary step would be to pilot a set of daily focus / goal-momentum training guidance notes incorporating the dual-process goal-momentum model. A form of 'think-aloud' method (e.g., van Oort, Schröder, & French, 2011) could be employed to gauge the reactions of possible target audiences.

Future studies could also further investigate the extent to which the dual-process goal-momentum model can account for individual differences in responses to self-regulatory

training. An obvious step would be to re-examine the relationship between CFC and engagement with a longer intervention than in Study 3. The influence of cognitive style could also be re-examined with alternative measures to Epstein et al.'s (1996) Rational Experiential Inventory. Other variables of interest include general intelligence and working memory capacity (see Evans, 2008).

In this thesis the dual-process goal-momentum model was used to specify the goal-state substitution and core goal-momentum interventions tested. However, it could equally be used to specify interventions within the other GSFC higher order categories of coping. Also, various elements of the GSFC models could be expanded for more detailed hypothesis testing. This thesis focused on developing personal resource constructs (i.e., SI/PI/TI self-regulatory knowledge, beliefs and skills) represented by the size of the oval within each attentional goal tunnel (see Figure 7.1) and applied them to the core goal-momentum intervention. These constructs could, however, also be applied to goal-state detachment and substitution interventions.

As attentional focus was a key feature distinguishing the different GSFC coping categories, experimenting with ways of manipulating and enhancing attention, for example, through aspects of mindfulness (e.g., Kabat-Zinn, 2003), could also be explored. This would not simply involve the goal-state detachment model, but all four GSFC models, as mindfulness could serve different functions.

Another key element of the model that could be further developed is the nature of the goals pursued and the relationships between them, i.e., differentiating between various subtypes of type 1 and 2 goals. Additional goal-related issues are briefly discussed in the next section.

9.4.2 Enhancing stress-reduction process (goal momentum)

9.4.2.1 *Strategic intelligence*

This was the least addressed but arguably the most important concept for the longer term, as the goals we pursue shape our lives and societies. The challenge is to find an appropriate balance of goal pursuits that is workable and sustainable for individual and collective well-being. As highlighted by Layard (2005), cited in Chapter 1, many of our current strategies for pursuing 'happiness' appear fundamentally flawed (e.g., based on unsustainable patterns of consumption and 'zero-sum' games). Psychology can play an important role in highlighting key issues to address and offering explanatory theories and models. Examples of relevant goal-related theories include: presumed fundamental needs, e.g., self-determination theory (SDT; Deci & Ryan, 1985, 2000), sources of individual difference, e.g., motive disposition theory (MDT; McClelland, 1985), changes across the lifespan, e.g., socioemotional selectivity theory (Carstensen,

Isaacowitz, & Charles, 1999), as well as possible cultural differences (e.g., Elliot, Chirkov, Kim, & Sheldon, 2001).

Engaging in more appropriate goal pursuits is only one part of the challenge however. Learning to disengage from maladaptive goal pursuits will be equally important. As highlighted by, for example, Wrosch, Miller, Scheier, & De Pontet (2007), the ability to disengage from unattainable goals appears to be associated with both physical and psychological well-being. However, as demonstrated by Ntoumanis, Healy, Sedikides, Smith, & Duda (2014), disengagement is likely to be difficult to achieve where goal strivings have become highly integrated into the self and hence autonomously motivated. Psychological initiatives alone may be insufficient. However, the better the understanding of the possibilities and limitations at this level, the more appropriate initiatives are likely to be at other levels (e.g., socially, economically).

9.4.2.2 *Perceptual intelligence*

A key PI question is how to better develop people's ability to challenge their own perceptions, particularly without input from a third party. Part of the strategy outlined in Chapter 5 was to encourage intra-personal perspective taking, through different 'self' related metaphors, e.g., impulsive/rational/habitual selves.

Another strategy would be to try to 'inoculate' participants against other phenomena that could undermine PI, such as the 'Ostrich problem', i.e., failing to monitor goal progress (e.g., Webb, Chang, & Benn, 2013) and various sources of bias and error, such as heuristic short cuts (e.g., Tversky & Kahneman, 1974), errors in affective forecasting (e.g., Wilson & Gilbert, 2005) and cold-hot empathy gaps (e.g., Nordgren, van der Pligt, & van Harreveld, 2007).

However, providing participants with too much information could be counterproductive, as appeared to be the case in Study 1. A possible solution might ultimately be to tailor information provision to different patterns of response / perceived PI weaknesses. Examples from the writing sessions in Studies 2 and 3 included: venting frustrations without any analysis, analysing but without considering alternative interpretations, and using the sessions more as a descriptive diary than a planning tool. Follow-up interviews with such participants could help to clarify whether the problems were related to information provision (i.e., need for better instructions) or personal limitations (i.e., need for better targeting).

9.4.2.3 *Tactical intelligence*

TI addresses the organisation, flexibility and resourcefulness with which goals are pursued. The idea behind the design of the TI writing activities was to prompt participants to apply the most useful TI skills on a daily basis. As there is a limit to how

much participants can consider in a 10 to 15 minute writing session, the challenge was and is to find the most potent combination of activities to fit into the limited time and space available.

In the original design for Study 1, the writing activities were organised incrementally to match increasing levels of goal progress difficulty. The initial activities up to 'problem rebalancing' had been well used, but not the final two activities, i.e., 'finding alternative routes' and 'planning and rehearsing key actions' (see Appendix C7). For Studies 2 and 3, the final activity was dropped and two new ones added, i.e., 'actions towards long-term goals' and 'shaping one's physical and social environment'. Participants often used the latter, but not 'finding alternative routes' or 'actions towards long-term goals' (see Appendices D7 and E13).

A challenge for future studies, therefore, is to find ways of encouraging longer term thinking and more creativity in overcoming barriers to progress. Fredrickson's (2001, 2013) broaden-and-build theory suggests that positive emotions broaden attention and thinking as well as resilience and creativity. Thus, stressed people may be particularly poorly disposed to take advantage of such activities. Studies focusing on self-regulation rather than stress-reduction, i.e., involving less stressed participants, might find these activities better used. For stressed participants, it might help to add activities designed to instil more positive affective states. Possibilities include self-affirmation (e.g., Koole, Smeets, van Knippenberg, & Dijksterhuis, 1999), savouring (e.g., Quoidbach, Berry, Hansenne, & Mikolajczak, 2010) and performing acts of kindness (e.g., Buchanan & Bardi, 2010).

The modular structure of the writing sessions makes it easy to test different types and combinations of activities. Thus, researchers with different areas of expertise could refine and test components of particular interest to them and compare them with alternative combinations of writing activities. They could also tailor interventions to different types of people and situations.

9.4.3 Motivation/learning/reinforcement process

Though the various process levels were combined within the training materials, each had a distinctive role. The SI/PI/TI activities constituted the desired health behaviour. The motivation/learning/reinforcement level addressed the cognitive constructs and processes targeted to promote the initiation, learning and maintenance of the health behaviour. The communication level addressed the general language and presentation principles used to enhance the overall impact.

As the health behaviour was and is still under development, the treatment of the motivation/learning/reinforcement level was far from comprehensive and can undoubtedly be improved. Examples of possible improvements are illustrated below under the phases of behaviour change headings described in Chapter 5, i.e., motivation, volition and automatisisation.

For motivation, though the SCT model adopted for this process level is classified as a motivational model (Armitage & Conner, 2000), the model's constructs were only addressed in a limited way. As there was no established behaviour-specific self-efficacy measure for the SI/PI/TI activities, a general measure was used. Until a more specific measure exists, subsequent studies could perhaps employ a simple single item measure, as used for outcome expectations. The other constructs, such as outcome expectations and sociostructural factors, could also be addressed in more depth, once the evidence base is more established for the health behaviour. A further point on motivation is that the participants in the three studies were already motivated to address stress. Extending the health behaviour to a broader population might require additional constructs to be targeted, such as health risks, and thus involve different social cognition models. The health action process approach model (HAPA; Schwarzer, 1992), for example, would be a logical next step, as it includes a construct for risk perception and was described by Armitage & Conner (2000) as superseding Bandura's (1986, 2001) SCT model.

As highlighted by Witte & Allen (2000), however, it is not just risk perception that is important but also people's perceptions about the efficacy of behaviours designed to reduce that risk. This is illustrated, for example, by Witte's (1992) Extended Parallel Process Model (EPPM), which suggests that any intervention would need to balance perceptions of threats and response efficacy to ensure that the message communicated is accepted and acted upon rather than rejected. Section 9.4.4 also highlights a number of other issues that would need to be considered in any communication of risks.

For enhancing volition, the main focus was on incorporating a dual-process approach (Evans, 2008) into the SCT model to help address impulsive drives. As social cognition models have conventionally been designed to address conscious determinants of behaviour, there was no established blueprint for applying the SCT model to unconscious determinants. The approach adopted in trying to regulate type 1 unconscious processes was 'indirect', e.g., avoiding situations likely to trigger maladaptive reactions. However, it may be possible to incorporate more direct approaches, such as cognitive bias modification (CBM), to try to correct maladaptive attentional or interpretive biases. Addressing the latter may be a more productive route,

as a meta-analysis by Hallion & Ruscio (2011) found that CBM interventions appeared to have greater effects on interpretive biases ($g = 0.81$) than on attentional biases ($g = 0.29$), which possibly suggests attentional biases may be more resistant to change.

A widely used method for manipulating interpretive biases is the 'ambiguous situations' paradigm (Mathews & Mackintosh, 2000), in which participants fill in missing letters in word fragments that give positive, negative or neutral meanings to ambiguous sentences. As this paradigm has already been successfully used in Internet-based interventions (e.g., Salemink, Kindt, Rienties, & van den Hout, 2014) to induce more positive interpretations, it might be feasible to incorporate this type of activity into a future goal-momentum training programme. For example, a CBM element could be added to PI activities to increase confidence and engagement in various goal pursuits. However, as highlighted by Mobini, Reynolds, & Mackintosh (2013), CBM effects have generally only been demonstrated over relatively short periods (e.g., 24 hours) and so repeated training sessions may be necessary to induce more sustainable changes.

With respect to the automatisisation of SI/PI/TI activities, there is still much to learn before this phase of the behaviour change process can be reliably charted in any detail. Key issues requiring further investigation, for example, include the length of time necessary to establish a regular writing habit (e.g., daily DF sessions), personal or environmental factors influencing the rate and degree of automatisisation, and whether there is any advantage to maintaining a daily writing habit as opposed to simply having learnt the techniques involved. For the latter issue, one might expect continued daily focus sessions to yield more sustainable improvements, e.g., based on Lyubomirsky, Sheldon, & Schkade's (2005) model of longitudinal well-being, which suggests that intentional activity-based changes are less prone to hedonic adaptation than circumstance-based changes.

A further point regarding the treatment of this process level is that it was essentially a bottom-up approach, i.e., the model choice was based on self-efficacy, a core component of the intervention under development. This reflected the priority given to the development of the core SI/PI/TI activities. However, once the writing activities are more established and the focus shifts to the motivation/learning/reinforcement process level, a top-down approach involving a more comprehensive model might be more appropriate. An example is the behaviour change wheel / COM-B model of human behaviour (Michie, van Stralen, & West, 2011), which already includes type 1 and 2 processes and highlights a broad range of resources that could potentially be brought into play in supporting the desired behaviour change.

A final point, as noted in Chapter 5, is that this process level encompasses more than just motivation, volition and automatisisation. Due to the complexity and largely abstract nature of the behaviours involved, there is much to learn about how best to teach and reinforce such skills. As noted in section 5.4, educational research, particularly involving the use of computer technology, could offer useful insights. Also, research into various learning difficulties such as autism and dyslexia could help adapt the training to the needs of particular groups.

Autism, for example, is associated with difficulties with social understanding and interaction, language and communication, repetitive stereotyped behaviours and poor imagination (Wing & Gould, 1979). Theories about possible causal mechanisms can be used to try to tailor interventions to better meet the needs of people with autism.

The theory of mind hypothesis (Baron-Cohen, Leslie, & Frith, 1985), for example, associates autism with a developmental deficit or delay in the ability to infer the mental states of others. Thus, training that incorporates explicit guidance on 'perspective-taking', as demonstrated for example by Ozonoff & Miller (1995), could help address this.

As a further example, the executive dysfunction hypothesis (e.g., Ozonoff, Pennington, & Rogers, 1991) associates autism with possible deficits in complex cognitive processes such as self-monitoring, planning, problem solving and impulse control, which are particularly important for type 2 goal pursuits. As suggested by Ozonoff et al. (1991), people with autism might therefore benefit from more explicit guidance on how to plan and organise particular goal pursuits, as well as how to monitor their progress and adapt their plans when necessary.

As a final example, the weak central coherence hypothesis (Frith, 1989; Happé, 1999) associates autism with a bias towards local over global processing, i.e., seeing the detail or constituent parts, but not the bigger picture. As highlighted by Happé & Frith (2006), this appears to involve a preference for local processing rather than a deficit in global processing. Thus, with suitable instructions, interventions could perhaps encourage more global processing wherever appropriate.

As an illustration of the feasibility of such adaptations, MacKay & Greig (2013) drew on these three theories and others to adapt CBT training to the needs of children and adolescents with autism and reported improvements in measures of anxiety, depression and stress. As the goal-momentum intervention, particularly the PI component, is based on similar principles to CBT, it should be feasible to incorporate such adaptations into future goal-momentum interventions.

9.4.4 Communication/presentation process

A number of steps were taken to try to enhance the communication and presentation of information within the interventions. However, as with the previous process level, this was not addressed in depth and thus there should be opportunities for further enhancement. For example, if as discussed in the previous section, future interventions were to address risk perceptions, there are different ways of presenting risks that could influence motivation. As highlighted by Edwards, Elwyn, Covey, Matthews, & Pill (2001), for example, these include the amount and complexity of risk data, whether presented verbally or numerically, as relative risk or absolute risk, and whether loss framed or gain framed.

More generally, there could also be opportunities to explore dual-process approaches to communication, e.g., applying theories such as Petty & Cacioppo's (1986) elaboration likelihood model of persuasion or Chaiken's (1980) heuristic-systematic model.

An increasingly important area, however, particularly for online interventions, is the issue of the mode of presentation. As highlighted by Webb et al.'s (2010) mode of delivery taxonomy for Internet-based interventions, cited in Chapter 5, there is an increasing array of delivery options as information technology advances. This offers many possible avenues for enhancing the scope and effectiveness of Internet-based interventions, e.g., through tailoring information more precisely to the needs of specific individuals (e.g., Noar, Benac, & Harris, 2007), use of automated prompts or feedback (e.g., Hurling et al., 2007), and gamification (e.g., King, Greaves, Exeter, & Darzi, 2013).

However, the many types of possible enhancements described by Webb et al. (2010) could also obfuscate comparisons between interventions. For example, a poor design at a stress-reduction enhancement level (e.g., PI or TI self-regulatory writing activity) might be compensated by a powerful feature (e.g., automated or communicative function) at the mode of delivery / presentation level. Thus, as interventions become more sophisticated, it will become increasingly important to identify key process components and levels to ensure like-with-like comparisons are made.

9.4.5 Research process

This process level was addressed using the MRC framework (Figure 3.2 in Chapter 3) for developing and evaluating complex interventions (MRC, 2000; Craig et al., 2008). As the framework was intended for end interventions, rather than an intermediate means to an end as proposed in this thesis, there may be better ways of mapping this

process level. However, the MRC framework at least provided a structure for addressing research process issues in a systematic way.

The first three phases of the MRC framework, 'development', 'feasibility and piloting', and 'evaluation' have been repeatedly addressed at various stages throughout this thesis. This has resulted in a template for online writing interventions that appears capable of generating sustainable improvements in psychological well-being and can also be adapted to develop and test a broad array of self-regulatory coping mechanisms and techniques. This final section addresses the fourth phase of the MRC framework, i.e., 'implementation', which consists of 'dissemination', 'surveillance and monitoring', and 'long-term follow-up'.

The process of dissemination begins with this thesis and will also involve attempts at publication, presentation at conferences, and funding applications for postdoctoral research. The peer review involved in these processes should also help refine arguments in support of the research and pinpoint opportunities for further development. If funding is secured, the postdoctoral research would have two aims. The first would be to continue the development of the goal-momentum intervention, addressing research questions discussed above and to test this against other types of intervention from the GSFC taxonomy.

The second aim would be to develop a facility for sharing online writing intervention templates/prototypes with other researchers. This could be supported with guidance on key issues such as recruitment, research questions, selection of measures and comprehensive reporting of results, which would hopefully enhance the quality and coherence of the ensuing research. The scale of the project would depend on the level of funding. With minimal resources, intervention templates could be shared using the existing Bristol Online Survey website. With more significant funding, for example, for a project involving several universities, a suite of intervention prototypes could be developed using a more sophisticated software platform, such as the 'LifeGuide' toolkit (e.g., Yang et al., 2009).

The aim of the subsequent 'surveillance and monitoring' stage would be to try to focus and drive ongoing research efforts towards establishing reliable end interventions for widespread public use. A key element would be to try to maximise opportunities for synergy amongst research studies. A form of central registry or database of results would be particularly useful in view of the difficulty in getting non-significant results published in academic journals. The resulting evidence base could ultimately enable researchers to tailor interventions to specific types of people and situations, and direct those unlikely to benefit towards alternative solutions.

End interventions could include stress management, but as previously argued the far greater potential ultimately lies in trying to foster the development of a more comprehensive range of self-regulatory skills. Interventions could either be generic, e.g., providing a broad base of useful life skills, or specific, e.g., addressing particular self-regulatory challenges such as losing weight, increasing physical activity, or curbing various addictive behaviours. Though there would be considerable variety across interventions, the core focus would be on the self-regulatory challenge of balancing type 1 and type 2 goal pursuits. The various types of training could adopt the SI/PI/TI framework used for this thesis, or extensions of this, or completely new concepts developed as the research and interventions evolve.

The nature and scale of any 'long-term follow-up' would again depend on funding. A particular advantage of online interventions is that even if ultimately used unsupported, i.e., not part of a supervised research study, usage and results could still be monitored. Such monitoring would be important, as interventions may need to evolve over time as environments change. Also, ongoing research may create opportunities for further enhancements.

9.5 Conclusion

As highlighted in Chapter 1, self-regulatory processes and skills are fundamentally important in enabling individuals to shape their thinking and behaviour to achieve what they want from life. Although many problems faced by individuals and societies can be linked to poor self-regulation, there is no widespread formal training in such skills.

Advances in information technology offer the possibility of extending self-regulatory skills training to millions of people at relatively little cost. Though the technological infrastructure may already exist, the psychological knowledge of how or whether it is possible to achieve a population shift in self-regulatory capacity has yet to be established. Research is therefore needed to understand the extent to which people's self-regulatory behaviours can be enhanced and the conditions under which this can best be achieved.

To this end, this thesis has taken a popular but narrowly exploited research tool and demonstrated how it can be extended to test and refine very different self-regulatory interventions and explore how different people respond to such training. It is a deceptively simple tool, but if used to its full potential, offers many avenues for extending self-regulatory theory and developing and testing evidence-based solutions to the many self-regulatory challenges people face.

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Appendix A: Families of coping taxonomy (Skinner et al., 2003)

Family of Coping	Family Function in Adaptive Process	Adaptive Process	Also implicated
Problem-solving Strategizing Instrumental action Planning	Adjust actions to be effective	Coordinate actions and contingencies in the environment	Watch and learn Mastery Efficacy
Information Seeking Reading Observation Asking others	Find additional contingencies		Curiosity Interest
Helplessness Confusion Cognitive interference Cognitive exhaustion	Find limits of actions		Guilt Helplessness
Escape Cognitive avoidance Behavioral avoidance Denial Wishful thinking	Escape noncontingent environment		Drop and roll Flight Fear
Self-reliance Emotion regulation* Behavior regulation Emotional expression Emotion approach	Protect available social resources	Coordinate reliance and social resources available	Tend and befriend Pride
Support Seeking Contact seeking Comfort seeking Instrumental aid Spiritual support	Use available social resources		Proximity-seeking Yearning Other alliance
Delegation Maladaptive help-seeking Complaining Whining Self-pity	Find limits of resources		Self-pity Shame
Isolation Social withdrawal* Concealment Avoiding others	Withdraw from unsupportive context		Duck and cover Freeze Sadness
Accommodation Distraction* Cognitive restructuring* Minimization Acceptance	Flexibly adjust preferences to options	Coordinate preferences and available options	Pick and choose Secondary Control
Negotiation Bargaining Persuasion Priority-setting	Find new options		Compromise
Submission Rumination* Rigid perseveration Intrusive thoughts	Give up preferences		Disgust Rigid perseverance
Opposition Other-blame Projection Aggression	Remove constraints		Stand and fight Anger Defiance

Appendix B1: Summary of key measures used across studies

Measure – items	Study 1		Study 2					Study 3		
	Time 1	Time 2	Time 1	Time 2	Time 3	Time 4	Time 5	Time 1	Time 2	Time 3
PNES – 12	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
PSS – 10	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
GOSS – 6	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
GSE – 10	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
HINT – 12	✓	✓	✓			✓	✓	✓	✓	✓
LOT-R – 10	✓		✓			✓	✓	✓	✓	✓
ISEL – 12	✓	✓	✓			✓		✓		
TIPI – 10	✓		✓					✓		
HADS – 14			✓	✓	✓	✓	✓	✓	✓	✓
W-BNS – 18			✓			✓	✓	✓	✓	✓
Brief COPE – 28	✓							✓	✓	✓
CFC – 12			✓					✓		
SES – 10	✓	✓								
NCS – 18	✓									
REI – 10			✓							

Note 1: To avoid repetition, each scale is shown once in full in Appendices B2 to B16 below. Thereafter, they are listed in order of presentation in the various study questionnaires in which they were used (shown in Appendices C, D and E).

Note 2: Where discussed in the thesis, scale items are referred to according to their order as shown in the screenshots provided (Appendices B2 to B16). Thus, the first item in each scale is referred to as 'item 1', the second item, 'item 2' and so on. The different numbering shown in the screenshots stems from The automatic numbering generated by the Bristol Online Survey webpages from which the screenshots were taken.

Appendix B2: PNES – 12 (Cohen et al., 2006)

Below are a number of words that describe different **feelings and emotions**.

Please read each word and then indicate how much you felt that way during **THE PAST WEEK** by ticking the appropriate box.

39. Calm

☐ not at all..... ☐ a little..... ☐ moderately..... ☐ quite a bit..... ☐ extremely

40. Hostile

☐ not at all..... ☐ a little..... ☐ moderately..... ☐ quite a bit..... ☐ extremely

41. Happy

☐ not at all..... ☐ a little..... ☐ moderately..... ☐ quite a bit..... ☐ extremely

42. On edge

☐ not at all..... ☐ a little..... ☐ moderately..... ☐ quite a bit..... ☐ extremely

43. Cheerful

☐ not at all..... ☐ a little..... ☐ moderately..... ☐ quite a bit..... ☐ extremely

44. Angry

☐ not at all..... ☐ a little..... ☐ moderately..... ☐ quite a bit..... ☐ extremely

45. Full of pep

☐ not at all..... ☐ a little..... ☐ moderately..... ☐ quite a bit..... ☐ extremely

46. Sad

☐ not at all..... ☐ a little..... ☐ moderately..... ☐ quite a bit..... ☐ extremely

47. At ease

☐ not at all..... ☐ a little..... ☐ moderately..... ☐ quite a bit..... ☐ extremely

48. Tense

☐ not at all..... ☐ a little..... ☐ moderately..... ☐ quite a bit..... ☐ extremely

49. Lively

☐ not at all..... ☐ a little..... ☐ moderately..... ☐ quite a bit..... ☐ extremely

50. Unhappy

☐ not at all..... ☐ a little..... ☐ moderately..... ☐ quite a bit..... ☐ extremely

Appendix B3: PSS – 10 (Cohen & Williamson, 1988)

<p>The questions ask you about your feelings and thoughts during THE PAST WEEK.</p> <p>In each case, please tick the response which most accurately represents HOW OFTEN you felt or thought a certain way.</p>	
<p>51. In the past week, how often have you been upset because of something that happened unexpectedly?</p> <p><input type="radio"/> never..... <input type="radio"/> almost never..... <input type="radio"/> sometimes..... <input type="radio"/> fairly often..... <input type="radio"/> very often</p>	
<p>52. In the past week, how often have you felt that you were unable to control the important things in your life?</p> <p><input type="radio"/> never..... <input type="radio"/> almost never..... <input type="radio"/> sometimes..... <input type="radio"/> fairly often..... <input type="radio"/> very often</p>	
<p>53. In the past week, how often have you felt nervous and "stressed"?</p> <p><input type="radio"/> never..... <input type="radio"/> almost never..... <input type="radio"/> sometimes..... <input type="radio"/> fairly often..... <input type="radio"/> very often</p>	
<p>54. In the past week, how often have you felt confident about your ability to handle your personal problems?</p> <p><input type="radio"/> never..... <input type="radio"/> almost never..... <input type="radio"/> sometimes..... <input type="radio"/> fairly often..... <input type="radio"/> very often</p>	
<p>55. In the past week, how often have you felt that things were going your way?</p> <p><input type="radio"/> never..... <input type="radio"/> almost never..... <input type="radio"/> sometimes..... <input type="radio"/> fairly often..... <input type="radio"/> very often</p>	
<p>56. In the past week, how often have you found that you could not cope with all the things that you had to do?</p> <p><input type="radio"/> never..... <input type="radio"/> almost never..... <input type="radio"/> sometimes..... <input type="radio"/> fairly often..... <input type="radio"/> very often</p>	
<p>57. In the past week, how often have you been able to control irritations in your life?</p> <p><input type="radio"/> never..... <input type="radio"/> almost never..... <input type="radio"/> sometimes..... <input type="radio"/> fairly often..... <input type="radio"/> very often</p>	
<p>58. In the past week,, how often have you felt that you were on top of things?</p> <p><input type="radio"/> never..... <input type="radio"/> almost never..... <input type="radio"/> sometimes..... <input type="radio"/> fairly often..... <input type="radio"/> very often</p>	
<p>59. In the past week, how often have you been angered because of things that were outside your control?</p> <p><input type="radio"/> never..... <input type="radio"/> almost never..... <input type="radio"/> sometimes..... <input type="radio"/> fairly often..... <input type="radio"/> very often</p>	
<p>60. In the past week, how often have you felt difficulties were piling up so high that you could not overcome them?</p> <p><input type="radio"/> never..... <input type="radio"/> almost never..... <input type="radio"/> sometimes..... <input type="radio"/> fairly often..... <input type="radio"/> very often</p>	

Appendix B4: GOSS – 6 (Yardley & Dibb, 2007)

75. With regard to the 6 areas of life listed below, please try to **imagine your ideal situation in each area**.

Then for each question please tick the box which is the most accurate for you.

	to a large extent away	to a medium extent away	just slightly away	not moving at all	just slightly towards	to a medium extent towards	to a large extent towards
a. To what extent do you feel that you are moving away from or towards your ideal situation with your family and friends .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. To what extent do you feel that you are moving away from or towards your ideal situation with your work .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. To what extent do you feel that you are moving away from or towards your ideal situation with your finances .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d. To what extent do you feel that you are moving away from or towards your ideal situation with your social life and activities .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e. To what extent do you feel that you are moving away from or towards your ideal situation with your physical health or well-being .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f. To what extent do you feel that you are moving away from or towards your ideal situation with your emotional well-being .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Appendix B5: GSE – 10 (Schwarzer & Jerusalem, 1995)

This next section has a list of 10 statements.	
Please indicate the extent to which you think each statement is true about you.	
98. I can always manage to solve difficult problems if I try hard enough	
<input type="radio"/> Not at all true.....	<input type="radio"/> Hardly true..... <input type="radio"/> Moderately true..... <input type="radio"/> Exactly true
99. If someone opposes me, I can find the means and ways to get what I want.	
<input type="radio"/> Not at all true.....	<input type="radio"/> Hardly true..... <input type="radio"/> Moderately true..... <input type="radio"/> Exactly true
100. It is easy for me to stick to my aims and accomplish my goals.	
<input type="radio"/> Not at all true.....	<input type="radio"/> Hardly true..... <input type="radio"/> Moderately true..... <input type="radio"/> Exactly true
101. I am confident that I could deal efficiently with unexpected events.	
<input type="radio"/> Not at all true.....	<input type="radio"/> Hardly true..... <input type="radio"/> Moderately true..... <input type="radio"/> Exactly true
102. Thanks to my resourcefulness, I know how to handle unforeseen situations.	
<input type="radio"/> Not at all true.....	<input type="radio"/> Hardly true..... <input type="radio"/> Moderately true..... <input type="radio"/> Exactly true
103. I can solve most problems if I invest the necessary effort.	
<input type="radio"/> Not at all true.....	<input type="radio"/> Hardly true..... <input type="radio"/> Moderately true..... <input type="radio"/> Exactly true
104. I can remain calm when facing difficulties because I can rely on my coping abilities.	
<input type="radio"/> Not at all true.....	<input type="radio"/> Hardly true..... <input type="radio"/> Moderately true..... <input type="radio"/> Exactly true
105. When I am confronted with a problem, I can usually find several solutions.	
<input type="radio"/> Not at all true.....	<input type="radio"/> Hardly true..... <input type="radio"/> Moderately true..... <input type="radio"/> Exactly true
106. If I am in trouble, I can usually think of a solution.	
<input type="radio"/> Not at all true.....	<input type="radio"/> Hardly true..... <input type="radio"/> Moderately true..... <input type="radio"/> Exactly true
107. I can usually handle whatever comes my way.	
<input type="radio"/> Not at all true.....	<input type="radio"/> Hardly true..... <input type="radio"/> Moderately true..... <input type="radio"/> Exactly true

Appendix B6: HINT – 12 (Verplanken et al., 2007)

PART 1

In the boxes below, please write down **typical thoughts, concerns or worries that you find come to mind and cause you stress or anxiety**. These can be related to any area of life e.g. work, career, relationships with others, health, forthcoming events etc.

Please note down each specific worry in a separate box, using a few words to describe each one.

Then below each type of worry, please provide a rating of **how serious** you consider each one i.e. **ranging from 1 = "somewhat worrying" up to a maximum of 5 = "extremely worrying"**.

You can describe one or more worries (up to 3 worries). Please note you need to fill in at least one 'worry' box to be able to answer the follow-up question in Section 7 - Part 2 below.

76. Please briefly describe worry 1

◦ 1 somewhat worrying..... ◦ 2 fairly worrying..... ◦ 3 significantly worrying..... ◦ 4 very worrying..... ◦ 5 extremely worrying

77. Worry 2 (Optional)

(Optional)

◦ 1 somewhat worrying..... ◦ 2 fairly worrying..... ◦ 3 significantly worrying..... ◦ 4 very worrying..... ◦ 5 extremely worrying

78. Worry 3 (Optional)

(Optional)

◦ 1 somewhat worrying..... ◦ 2 fairly worrying..... ◦ 3 significantly worrying..... ◦ 4 very worrying..... ◦ 5 extremely worrying

PART 2

79. This next set of questions addresses the how such thoughts/concerns/worries generally come to mind.

The table below consists of 12 statements addressing the habitual nature of the worries you have indicated above. For each of the 12 statements below please give a rating of how strongly you disagree or agree.

Having these worrying thoughts is something ...

	strongly disagree	slightly disagree	neither agree nor disagree	slightly agree	strongly agree
a. ... I do frequently.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. ... I do automatically.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. ... I do unintentionally.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d. ... that feels sort of natural to me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e. ... I do without further thinking.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f. ... that would require mental effort to leave.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
g. ... I do every day.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

h. ... I start doing before I realize I'm doing it.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
i. ... I would find hard not to do.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
j. ... I don't do on purpose.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
k. ... that's typically "me."	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
l. ... I have been doing for a long time.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Appendix B7: LOT-R – 10 (Scheier et al., 1994)

109. Below is a list of statements of how people might think and feel. For each of the following sentences, indicate how much you disagree or agree with each statement by ticking the most honest and accurate response.

Try not to let your response to one statement influence your other responses.

Also please be careful to place your tick in the appropriate row.

	I disagree a lot	I disagree a little	I neither agree nor disagree	I agree a little	I agree a lot
a. In uncertain times, I usually expect the best.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. It's easy for me to relax.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. If something can go wrong for me, it will.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d. I'm always optimistic about my future.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e. I enjoy my friends a lot.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f. It's important for me to keep busy.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
g. I hardly ever expect things to go my way.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

h. I don't get upset too easily.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
i. I rarely count on good things happening to me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
j. Overall, I expect more good things to happen to me than bad.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Appendix B8: ISEL – 12 (Cohen et al., 1985)

This next section contains a list of 12 statements each of which may or may not be true about you.

For each statement pick "definitely true" if you are sure it is true about you and "probably true" if you think it is true but are not absolutely certain.

Similarly, you should select "definitely false" if you are sure the statement is false and "probably false" if you think it is false but are not absolutely certain.

113. If I wanted to go on a trip for a day (for example, to the countryside or seaside), I would have a hard time finding someone to go with me.

- 1. definitely false..... ◦ 2. probably false..... ◦ 3. probably true..... ◦ 4. definitely true

114. I feel that there is no one I can share my most private worries and fears with.

- 1. definitely false..... ◦ 2. probably false..... ◦ 3. probably true..... ◦ 4. definitely true

115. If I were sick, I could easily find someone to help me with my daily chores.

- 1. definitely false..... ◦ 2. probably false..... ◦ 3. probably true..... ◦ 4. definitely true

116. There is someone I can turn to for advice about handling problems with my family.

- 1. definitely false..... ◦ 2. probably false..... ◦ 3. probably true..... ◦ 4. definitely true

117. If I decide one afternoon that I would like to go to a cinema that evening, I could easily find someone to go with me.

- 1. definitely false..... ◦ 2. probably false..... ◦ 3. probably true..... ◦ 4. definitely true

118. When I need suggestions on how to deal with a personal problem, I know someone I can turn to.

- 1. definitely false..... ◦ 2. probably false..... ◦ 3. probably true..... ◦ 4. definitely true

119. I don't often get invited to do things with others.

- 1. definitely false..... ◦ 2. probably false..... ◦ 3. probably true..... ◦ 4. definitely true

120. If I had to go out of town for a few weeks, it would be difficult to find someone who would look after my house or flat (the plants, pets, garden, etc.).

- 1. definitely false..... ◦ 2. probably false..... ◦ 3. probably true..... ◦ 4. definitely true

121. If I wanted to have lunch with someone, I could easily find someone to join me.

- 1. definitely false..... ◦ 2. probably false..... ◦ 3. probably true..... ◦ 4. definitely true

122. If I were stranded 10 miles from home, there is someone I could call who could come and get me.

- 1. definitely false..... ◦ 2. probably false..... ◦ 3. probably true..... ◦ 4. definitely true

123. If a family crisis arose, it would be difficult to find someone who could give me good advice about how to handle it.

- 1. definitely false..... ◦ 2. probably false..... ◦ 3. probably true..... ◦ 4. definitely true

124. If I needed some help in moving to a new house or flat, I would have a hard time finding someone to help me.

- 1. definitely false..... ◦ 2. probably false..... ◦ 3. probably true..... ◦ 4. definitely true

Appendix B9: TIPI – 10 (Gosling et al., 2003)

108. Here are a number of **personality traits** that may or may not apply to you. Please indicate next to each trait the extent to which you disagree or agree that the trait accurately describes you.

I see myself as...

	disagree strongly	disagree moderately	disagree a little	neither agree nor disagree	agree a little	agree moderately	agree strongly
a. extraverted, enthusiastic	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. critical, quarrelsome	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. dependable, self-disciplined	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d. anxious, easily upset	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e. open to new experiences, complex	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f. reserved, quiet	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
g. sympathetic, warm	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

h. disorganised, careless	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
i. calm, emotionally stable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
j. conventional, uncreative	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Appendix B10: HADS – 14 (Zigmond & Snaith, 1983)

Please read each item from the list below and tick the reply which comes closest to **how you have been feeling** in the **PAST WEEK**.

Don't take too long over your replies: your immediate reaction to each item will probably be more accurate than a long thought-out response.

61. I feel tense or 'wound up':

- ☐ Most of the time..... ☐ A lot of the time..... ☐ From time to time,occasionally..... ☐ Not at all

62. I still enjoy the things I used to enjoy:

- ☐ Definitely as much..... ☐ Not quite so much..... ☐ Only a little..... ☐ Hardly at all

63. I get a sort of frightened feeling as if something awful is about to happen:

- ☐ Very definitely and quite badly..... ☐ Yes, but not too badly..... ☐ A little, but it doesn't worry me..... ☐ Not at all

64. I can laugh and see the funny side of things:

- ☐ As much as I always could..... ☐ Not quite so much now..... ☐ Definitely not so much now..... ☐ Not at all

65. Worrying thoughts go through my mind:

- ☐ A great deal of the time..... ☐ A lot of the time..... ☐ From time to time, but not too often..... ☐ Only occasionally

66. I feel cheerful:

- ☐ Not at all ☐ Not often..... ☐ Sometimes..... ☐ Most of the time

67. I can sit at ease and feel relaxed:

- ☐ Definitely..... ☐ Usually..... ☐ Not Often..... ☐ Not at all

68. I feel as if I am slowed down:

- ☐ Nearly all the time..... ☐ Very often..... ☐ Sometimes..... ☐ Not at all

69. I get a sort of frightened feeling like 'butterflies' in the stomach:

- ☐ Not at all..... ☐ Occasionally..... ☐ Quite Often..... ☐ Very Often

70. I have lost interest in my appearance:

- ☐ Definitely..... ☐ I don't take as much care as I should..... ☐ I may not take quite as much care..... ☐ I take just as much care as ever

71. I feel restless as I have to be on the move:

- ☐ Very much indeed..... ☐ Quite a lot..... ☐ Not very much..... ☐ Not at all

72. I look forward with enjoyment to things:

- ☐ As much as I ever did..... ☐ Rather less than I used to..... ☐ Definitely less than I used to..... ☐ Hardly at all

73. I get sudden feelings of panic:

- ☐ Very often indeed..... ☐ Quite often..... ☐ Not very often..... ☐ Not at all

74. I can enjoy a good book or radio or TV program:

- ☐ Often..... ☐ Sometimes..... ☐ Not often..... ☐ Very seldom

Appendix B11: W-BNS – 18 (Broeck et al., 2010)

<p>The following statements relate to your personal experiences at work.</p> <p>Please indicate the extent to which you disagree or agree with each of the statements below.</p>	
80. I don't really feel connected with other people at my job.	
<input type="radio"/> Totally disagree..... <input type="radio"/> Somewhat agree.....	<input type="radio"/> Somewhat disagree..... <input type="radio"/> Totally agree
<input type="radio"/> Neither agree or disagree..... <input type="radio"/>	
81. I don't really feel competent in my job.	
<input type="radio"/> Totally disagree..... <input type="radio"/> Somewhat agree.....	<input type="radio"/> Somewhat disagree..... <input type="radio"/> Totally agree
<input type="radio"/> Neither agree or disagree..... <input type="radio"/>	
82. I feel like I can be myself at my job.	
<input type="radio"/> Totally disagree..... <input type="radio"/> Somewhat agree.....	<input type="radio"/> Somewhat disagree..... <input type="radio"/> Totally agree
<input type="radio"/> Neither agree or disagree..... <input type="radio"/>	
83. At work, I feel part of a group.	
<input type="radio"/> Totally disagree..... <input type="radio"/> Somewhat agree.....	<input type="radio"/> Somewhat disagree..... <input type="radio"/> Totally agree
<input type="radio"/> Neither agree or disagree..... <input type="radio"/>	
84. I really master my tasks at my job.	
<input type="radio"/> Totally disagree..... <input type="radio"/> Somewhat agree.....	<input type="radio"/> Somewhat disagree..... <input type="radio"/> Totally agree
<input type="radio"/> Neither agree or disagree..... <input type="radio"/>	
85. At work, I often feel like I have to follow other people's commands.	
<input type="radio"/> Totally disagree..... <input type="radio"/> Somewhat agree.....	<input type="radio"/> Somewhat disagree..... <input type="radio"/> Totally agree
<input type="radio"/> Neither agree or disagree..... <input type="radio"/>	
86. I don't really mix with other people at my job.	
<input type="radio"/> Totally disagree..... <input type="radio"/> Somewhat agree.....	<input type="radio"/> Somewhat disagree..... <input type="radio"/> Totally agree
<input type="radio"/> Neither agree or disagree..... <input type="radio"/>	
87. I feel competent at my job.	
<input type="radio"/> Totally disagree..... <input type="radio"/> Somewhat agree.....	<input type="radio"/> Somewhat disagree..... <input type="radio"/> Totally agree
<input type="radio"/> Neither agree or disagree..... <input type="radio"/>	
88. If I could choose, I would do things at work differently.	
<input type="radio"/> Totally disagree..... <input type="radio"/> Somewhat agree.....	<input type="radio"/> Somewhat disagree..... <input type="radio"/> Totally agree
<input type="radio"/> Neither agree or disagree..... <input type="radio"/>	
89. At work, I can talk with people about things that really matter to me.	
<input type="radio"/> Totally disagree..... <input type="radio"/> Somewhat agree.....	<input type="radio"/> Somewhat disagree..... <input type="radio"/> Totally agree
<input type="radio"/> Neither agree or disagree..... <input type="radio"/>	
90. I doubt whether I am able to execute / carry out my job properly.	
<input type="radio"/> Totally disagree..... <input type="radio"/> Somewhat agree.....	<input type="radio"/> Somewhat disagree..... <input type="radio"/> Totally agree
<input type="radio"/> Neither agree or disagree..... <input type="radio"/>	
91. The tasks I have to do at work are in line with what I really want to do.	
<input type="radio"/> Totally disagree..... <input type="radio"/> Somewhat agree.....	<input type="radio"/> Somewhat disagree..... <input type="radio"/> Totally agree
<input type="radio"/> Neither agree or disagree..... <input type="radio"/>	

<p>92. I often feel alone when I am with my colleagues.</p> <p> <input type="radio"/> Totally disagree..... <input type="radio"/> Somewhat disagree..... <input type="radio"/> Neither agree or disagree..... <input type="radio"/> Somewhat agree..... <input type="radio"/> Totally agree </p>
<p>93. I am good at the things I do in my job.</p> <p> <input type="radio"/> Totally disagree..... <input type="radio"/> Somewhat disagree..... <input type="radio"/> Neither agree or disagree..... <input type="radio"/> Somewhat agree..... <input type="radio"/> Totally agree </p>
<p>94. I feel free to do my job the way I think it could best be done.</p> <p> <input type="radio"/> Totally disagree..... <input type="radio"/> Somewhat disagree..... <input type="radio"/> Neither agree or disagree..... <input type="radio"/> Somewhat agree..... <input type="radio"/> Totally agree </p>
<p>95. Some people I work with are close friends of mine.</p> <p> <input type="radio"/> Totally disagree..... <input type="radio"/> Somewhat disagree..... <input type="radio"/> Neither agree or disagree..... <input type="radio"/> Somewhat agree..... <input type="radio"/> Totally agree </p>
<p>96. I have the feeling that I can accomplish even the most difficult tasks at work.</p> <p> <input type="radio"/> Totally disagree..... <input type="radio"/> Somewhat disagree..... <input type="radio"/> Neither agree or disagree..... <input type="radio"/> Somewhat agree..... <input type="radio"/> Totally agree </p>
<p>97. In my job, I feel forced to do things I do not want to do.</p> <p> <input type="radio"/> Totally disagree..... <input type="radio"/> Somewhat disagree..... <input type="radio"/> Neither agree or disagree..... <input type="radio"/> Somewhat agree..... <input type="radio"/> Totally agree </p>

Appendix B12: Brief COPE – 28 (Carver, 1997)

110. This next section addresses **how you usually cope with sources of stress in your life**. There are many ways of trying to deal with problems. Each item in the list below suggests a particular way of coping with difficult or stressful events or situations.

Please indicate for each item the extent to which you usually do what the item says. Different people do different things, but please think about what **YOU** usually do.

Try and rate each item separately from the other items.

Also **please be careful to place your tick in the appropriate row**.

When faced with stressful events or situations...

	I usually don't do this at all.	I usually do this a little bit.	I usually do this a medium amount.	I usually do this a lot.
a. I turn to work or other activities to take my mind off things.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. I concentrate my efforts on doing something about the situation I'm in.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

c. I say to myself - 'this isn't real'.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d. I use alcohol or other drugs to make myself feel better.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e. I get emotional support from others.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f. I give up on trying to deal with it.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
g. I take action to make the situation better.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
h. I refuse to believe that this has happened.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
i. I say things to let my unpleasant feelings escape.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
j. I get help and advice from other people.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
k. I use alcohol or other drugs to help me get through it.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
l. I try to see it in a different light, to make it seem more positive.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
m. I criticize myself.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
n. I try to come up with a strategy about what to do.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Brief COPE – 28 (continued)

111. This next set of questions is a continuation of the previous section. Again it addresses what you usually do when you experience a stressful event.

As before, for each of the items, please indicate the extent to which you usually respond in the way the item says.

Again, try and rate each item separately from the other items.

Please ensure you place your tick in the **correct row**.

When faced with stressful events or situations...

	I usually don't do this at all.	I usually do this a little bit.	I usually do this a medium amount.	I usually do this a lot.
a. I get comfort and understanding from someone.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. I give up the attempt to cope.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. I look for something good in what is happening.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

d. I make jokes about it.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e. I do something to think about it less, such as going to the cinema, watching TV, reading, daydreaming, sleeping, shopping etc.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f. I accept the reality of the fact that it has happened.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
g. I express my negative feelings.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
h. I try to find comfort in my religion or spiritual beliefs.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
i. I try to get advice or help from other people about what to do.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
j. I learn to live with it.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
k. I think hard about what steps to take.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
l. I blame myself for things that happened.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
m. I pray or meditate.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
n. I make fun of the situation.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Appendix B13: CFC – 12 (Strathman et al., 1994)

112. For each of the statements below, please indicate the extent to which you think the statement is characteristic of you.

	Extremely uncharacteristic	Somewhat uncharacteristic	Uncertain	Somewhat characteristic	Extremely characteristic
a. I consider how things might be in the future and try to influence those things with my day-to-day behaviour.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. Often I engage in a particular behaviour in order to achieve outcomes that may not result for many years.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. I only act to satisfy immediate concerns, figuring the future will take care of itself.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d. My behaviour is only influenced by the immediate (i.e. a matter of days or weeks) outcomes of my actions.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

e. My convenience is a big factor in the decisions I make or the actions I take.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f. I am willing to sacrifice my immediate happiness or well-being in order to achieve future outcomes.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
g. I think it is important to take warnings about negative outcomes seriously even if the negative outcomes will not occur for many years.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
h. I think it is more important to perform a behaviour with important distant consequences than a behaviour with less important immediate consequences.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
i. I generally ignore warnings about possible future problems because I think the problems will be resolved before they reach crisis level.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

j. I think that sacrificing now is usually unnecessary since future outcomes can be dealt with at a later time.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
k. I only act to satisfy immediate concerns, figuring that I will take care of future problems that may occur at a later date.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
l. Since my day-to-day work has specific outcomes, it is more important to me than behaviour that has distant outcomes.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Appendix B14: SES – 10 (Rosenberg, 1965)

Here is a list of 10 statements dealing with your general feelings about yourself. Please indicate the extent to which you either agree or disagree with each statement.	
47. On the whole, I am satisfied with myself.	<input type="radio"/> 1. strongly agree <input type="radio"/> 2. agree <input type="radio"/> 3. disagree <input type="radio"/> 4. strongly disagree
48. At times I think I am no good at all.	<input type="radio"/> 1. strongly agree <input type="radio"/> 2. agree <input type="radio"/> 3. disagree <input type="radio"/> 4. strongly disagree
49. I feel that I have a number of good qualities.	<input type="radio"/> 1. strongly agree <input type="radio"/> 2. agree <input type="radio"/> 3. disagree <input type="radio"/> 4. strongly disagree
50. I am able to do things as well as most other people.	<input type="radio"/> 1. strongly agree <input type="radio"/> 2. agree <input type="radio"/> 3. disagree <input type="radio"/> 4. strongly disagree
51. I feel I do not have much to be proud of.	<input type="radio"/> 1. strongly agree <input type="radio"/> 2. agree <input type="radio"/> 3. disagree <input type="radio"/> 4. strongly disagree
52. I certainly feel useless at times.	<input type="radio"/> 1. strongly agree <input type="radio"/> 2. agree <input type="radio"/> 3. disagree <input type="radio"/> 4. strongly disagree
53. I feel that I'm a person of worth, at least on an equal plane with others.	<input type="radio"/> 1. strongly agree <input type="radio"/> 2. agree <input type="radio"/> 3. disagree <input type="radio"/> 4. strongly disagree
54. I wish I could have more respect for myself.	<input type="radio"/> 1. strongly agree <input type="radio"/> 2. agree <input type="radio"/> 3. disagree <input type="radio"/> 4. strongly disagree
55. All in all, I am inclined to feel that I am a failure.	<input type="radio"/> 1. strongly agree <input type="radio"/> 2. agree <input type="radio"/> 3. disagree <input type="radio"/> 4. strongly disagree
56. I take a positive attitude toward myself.	<input type="radio"/> 1. strongly agree <input type="radio"/> 2. agree <input type="radio"/> 3. disagree <input type="radio"/> 4. strongly disagree

Appendix B15: NCS – 18 (Cacioppo et al., 1984)

69. There are 18 statements listed below. Please indicate the extent to which you agree or disagree with each statement.

Also please be careful to place your tick in the appropriate row.

	very strong agreement	strong agreement	moderate agreement	slight agreement	neither agreement nor disagreement	slight disagreement	moderate disagreement	strong disagreement	very strong disagreement
a. I would prefer complex to simple problems.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. I like to have the responsibility of handling a situation that requires a lot of thinking.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. Thinking is not my idea of fun.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d. I would rather do something that requires little thought than something that is sure to challenge my thinking abilities.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e. I try to anticipate and avoid situations where there is likely a chance I will have to think in depth about something.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f. I find satisfaction in deliberating hard and for long hours.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
g. I only think as hard as I have to.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
h. I prefer to think about small, daily projects to long-term ones.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
i. I like tasks that require little thought once I've learned them.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
j. The idea of relying on thought to make my way to the top appeals to me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
k. I really enjoy a task that involves coming up with new solutions to problems.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

i. Learning new ways to think doesn't excite me very much.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
m. I prefer my life to be filled with puzzles that I must solve.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
n. The notion of thinking abstractly is appealing to me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
o. I would prefer a task that is intellectual, difficult, and important to one that is somewhat important but does not require much thought.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

p. I feel relief rather than satisfaction after completing a task that required a lot of mental effort.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
q. It's enough for me that something gets the job done; I don't care how or why it works.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
r. I usually end up deliberating about issues even when they do not affect me personally.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Appendix B16: REI – 10 (Epstein et al., 1996)

9. For each statement below, please indicate the extent to which you think each is false or true.

Also please be careful to place your tick in the appropriate row.

	Completely false	Slightly false	No clear view either way	Slightly true	Completely true
a. I don't like to have to do a lot of thinking.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. I trust my initial feelings about people.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. I try to avoid situations that require thinking in depth about something.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d. I believe in trusting my hunches.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e. I prefer to do something that challenges my thinking abilities rather than something that requires little thought.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f. My initial impressions of people are almost always right.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

g. I prefer complex to simple problems.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
h. When it comes to trusting people, I can usually rely on my "gut feelings."	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
i. Thinking hard and for a long time about something gives me little satisfaction.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
j. I can usually feel when a person is right or wrong even if I can't explain how I know.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Appendix C1: Study 1: Participant information sheet



Participant Information Sheet

Project title: "Qualitative assessment of stress management skills training"

You are being invited to take part in a research study. Before you decide whether you would like to take part, it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully. Ask us if there is anything that is not clear or if you would like more information.

❖ **What is the purpose of the study?**

The purpose of this study is to test and refine a training programme providing a range of creative thinking skills designed to enhance well-being and combat sources of stress. This is an extension of an earlier study which appeared successful in improving aspects of participants' physical and psychological well-being over the course of a week. The focus of the present study is to investigate whether such improvements can be maintained and possibly even enhanced over the longer term. To achieve this, the design of the training tasks has been modified to make them more sustainable. We are now seeking to recruit a small number of participants who would be willing to practise the creative thinking skills over a period of 4 - 6 weeks and to provide feedback on what they have learned and report any effects on their well-being.

❖ **Who can take part?**

The training programme is designed to be of use to people busy with work and other commitments. There may also be potential for further fine-tuning of the skills and activities for different types of people (e.g. according to age, gender, personality type etc). We are therefore seeking to recruit men and women aged from 18 to 65. To try to ensure we are comparing similar working environments, we are aiming to recruit full-time administrative staff at the University of Bath in grades 3 to 7.

❖ **What does the study involve?**

There are three stages to the study. Stage 1 seeks to establish participants' views on stress-related issues before trying out the skills and activities. Stage 2 involves practising the creative thinking skills over a 4 - 6 week period. Stage 3 then assesses any possible changes resulting from the training programme. If you decide to take part, you are free to withdraw from the study at any time, without giving a reason. Further details on the stages are as follows:-

Stage 1

There are two elements to this stage. Participants will be asked to reflect on and note down their thoughts on the types of things they typically find stressful or taxing, how these impact on their lives and how they currently deal with them. This will be followed by a tick box questionnaire addressing factors that may influence participants' use of the thinking techniques.

Stage 2

Participants will be provided with a set of written instructions explaining the creative thinking skills and how to practise them. The recommended practice consists of 3 twenty minute sessions each week, for 4 - 6 weeks. Each session involves participants applying the thinking techniques to their current situations and noting down their conclusions. It is recommended that participants do this just before going to bed, like keeping a diary. The activities are designed to be enjoyable and to fit easily into everyday lifestyles. It is hoped that with practice, the techniques can become an automatic part of your everyday thinking.

Stage 3

There are two elements to this stage. Firstly participants will be asked to complete a follow up tick-box questionnaire, assessing the effectiveness of the training and any associated changes in well-being. The second element is an interview, which will explore participants' views on the use of the thinking techniques, their effectiveness in combating stress and implications for health and well-being. The interviews will be held in 6 West building and last between 45 and



60 minutes. They will be audio tape recorded and the contents transcribed for later analysis to explore any general patterns in participants' experiences.

A possible beneficial health outcome of the skills training is that it may also help reduce participants' levels of stress hormones. Recent research has suggested that changes in the levels of cortisol, a key stress hormone, can be assessed using samples of hair. This is an optional element of the study open to anyone not taking steroid medication or pregnant, as these are known to affect cortisol levels. If you are interested in having your cortisol levels assessed, two samples of your hair would be required, one at the beginning and one at the end of the study. To sample your hair we would need to take about 20mg (approximately 150 strands or 1cm in width) from an area just below the crown at the back of your head, close to the scalp. You can still take part in the research however if you do not want to provide hair samples.

❖ **Are there any risks or disadvantages of taking part in the study?**

There are no identified disadvantages or risks of taking part in this study. The thinking skills are derived from psychological research published in reputable academic journals. The skills are intended to improve participants' well-being by enhancing their capacity to deal successfully with stressful situations. Thinking about sources of stress and how to overcome them may not appeal to everyone however and so the techniques may not suit everyone. For those who volunteer to provide a hair sample, the procedure is non-invasive and will not cause any pain. We aim to sample the hair in such a way that it is hardly noticeable, although depending on hair style and volume, it is possible that on occasion some unevenness may be temporarily visible. The researcher will discuss this with participants and demonstrate on a model before sampling your hair.

❖ **Will my taking part in this study be kept confidential?**

Any information you provide will be kept strictly confidential. Participant hair samples and information provided in the questionnaires, written comments and interview transcripts will be anonymised i.e. identified by code number only. This information will be kept in locked cabinets at the University of Bath. Any contact details that you choose to give us for communicating about the research will be stored separately from the data collected. No one, other than the two Bath University researchers involved in the project, will see or have access to your details.

❖ **What will happen to the results of the research?**

Once the study has been completed, if you wish you can receive a summary of the main results via email. The findings may also be presented at conferences and be published in an academic journal. Some of this research will also be written up for a PhD thesis within the University of Bath. You will not be identified in any reports or publications of the research.

❖ **Who is organising the research?**

The project is funded by the University of Bath and is being carried out by Dr Julie Turner-Cobb (Principal Investigator) and Mr Steven Dean (PhD research student), both at the University of Bath, in collaboration with Dr David Jessop, at the University of Bristol. This study has been approved by the Research Ethics Committee in the Department of Psychology, at the University of Bath and adheres to British Psychological Society (BPS) guidelines for ethical practice in psychological research.

❖ **Contact for further information or assistance**

For further information or assistance concerning the study please contact Steven Dean by email: s.dean@bath.ac.uk.

Should you be concerned about any health or well-being issues raised during the course of the study then please contact your GP. Employees of the University of Bath can also access a free counselling service provided by the Royal United Hospital, Bath. The contact telephone numbers are (01225) 825960 or (01225) 824484.

Thank you for reading this information



Appendix C2: Study 1: Participant consent form



Study Number:

Participant Identification Number:

CONSENT FORM

Project title: "Qualitative assessment of stress management skills training"

Name of researchers:

Dr Julie Turner-Cobb (Principal Investigator), University of Bath

Dr David Jessop (Neuroimmunologist), University of Bristol

Mr Steven Dean (PhD Research Student), University of Bath

Please place tick in box

1. I confirm I have read and understand the Participant Information Sheet (version 290311) for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily.

☐

2. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason.

☐

3. I agree that anything I may say during the interview in Stage 3 as well as my written comments submitted in Stage 1 may be used as anonymous quotes in any presentation of the research (verbal presentation, paper publication or teaching purposes).

☐

4. I agree to take part in the above study.

☐

Name of Participant

Date

Signature

Researcher

Date

Signature

1 copy for participant: 1 copy for researcher.

Version 290311

Appendix C3: Study 1: Instructions

3-i Training Study Instructions

Thank you for agreeing to take part in this study. We hope you find it interesting and beneficial. The preliminary steps are:

1. Read **Participant information sheet**.
2. Complete and sign **Consent form**.
3. Complete **Participant details and history of hair treatment form** (Hair treatment section optional depending on whether you would like to provide hair samples).

Thereafter there are 3 stages to the study, outlined below. Your **participant ID number** for the various forms in the study is:

Study stages

1. **PRE-TRAINING** – Before we introduce you to the training materials, we would like to get an idea of your initial views relating to stress. This will enable us to make before and after comparisons, when assessing the effectiveness of the training programme. There are two elements:
 - 1.1. **Open question form** – This allows you to write freely about your views on 6 stress-related issues. You can return the form manually i.e. paper version, or electronically via email.
 - 1.2. **Online questionnaire 1** – Once you have returned the open question form, we will email you the link to 'Online questionnaire 1'. This contains simple tick box questions and is used to collect some basic demographic data. It also contains a series of rating scales related to stress, which again will be used for before and after comparison.
2. **TRAINING** – There are two main elements here:
 - 2.1. **Launch meeting** – This should require only about 10 minutes and will take place in 6 West building. It will be arranged once you have completed "Online Questionnaire 1." At this meeting you will be given a copy of the **training manual**, **activity summary instructions** and an **activities record form**. For participants providing hair samples, this is when the first sample will be collected.
 - 2.2. **Learning and applying the skills** – This is the core of the study when you get to try out the skills and see what effect they have. As you will see, there is a lot of flexibility in how you can apply the skills. Therefore for 4 weeks we would like you to note on the **activities record form** which activities you chose and email this record to us at the end of each week.
3. **POST-TRAINING** – This consists of 2 elements:
 - 3.1. **Online questionnaire 2** – This should be completed in week 5. You will be sent an email reminder with a link to the questionnaire.
 - 3.2. **Completion meeting** – Once you have completed online questionnaire 2, we will arrange a follow up meeting in week 5 or 6 depending on your availability. It will take place in 6 West Building and last about an hour. The main element of this is an **interview**, in which we would like you to give us your feedback on the thinking techniques and their effectiveness in combating stress. Also if you have chosen to have your hair cortisol tested, the **follow-up hair sample** will be collected before the interview.

Thank you for your participation. When we have completed the analysis of the study, we will send you a report outlining the key findings.

Appendix C4: Study 1: Open question form

Study Number: 11-888

3-i Open question form

PARTICIPANT ID NO:

DATE

A key objective of this study is to compare participants' views before and after the skills training programme. Thus before we ask any specific questions or introduce you to the skills and activities, we would like you to note down your current thoughts on a number of stress-related issues.

There are 6 questions. Please insert your answer after each question. You can write as little or as much as you like. However the more thought you can put into it the more productive the process is likely to be for you, as what you write here will provide a focus and a reference point for your use of the thinking skills.

Once you have completed the questions, please keep a copy for yourself and send a copy to Steve Dean via email [s.dean@bath.ac.uk]. Alternatively if you prefer to hand over a hard copy, this can be collected from you on campus in person whenever convenient for you.

Question 1: What types of things or situations do you find most stressful, challenging or taxing? (This can be inside or outside work or both.) As you outline each issue, try to identify and note possible root causes of difficulties or problems.

Question 2: Can you recognise when you are under stress? If so, how can you tell? What are the signs?

Question 3: How do you tend to react to or deal with various sources of stress? How effective do you think this is?

Question 4: What are your main priorities and / or concerns likely to be over the next month or so (i.e. during the course of this study)? Why are these particular issues important to you?

Question 5: Have you received any stress related training in the past? If yes, what did it involve, what did you learn and how useful was it?

Question 6: What are you hoping to gain from this training programme? What do you expect will happen?

Appendix C5: Study 1: Online questionnaire 1 (Time 1)

3-i Training – Online Questionnaire 1



Page 1 of 15

Welcome

Welcome to the 3-i Training skills - Questionnaire 1

Thank you for volunteering to take part in this study. We hope you find it interesting. There are two online questionnaires; this one, before you start the training programme and a second one about a month later, once you have had experience applying the training.

It would help with consistency if you could try to complete the two questionnaires at roughly similar times of day and in similar settings (e.g. both at home or both at your office).

All answers to the questions in these questionnaires will be kept strictly confidential. It will not be possible to identify your responses from any reports prepared. None of the information will be made available to anyone outside the research team.

There are 12 sections to this questionnaire. It should take about 20 to 25 minutes to complete. There are no right or wrong answers. Please simply indicate what seems right for you.

Please note that once you have clicked on the CONTINUE button at the bottom of each page you can not return to review or amend that page

Continue >

Page 2 of 15

3-i Training skills - Questionnaire 1

As stated on the previous page, all answers to the questions in this questionnaire will be kept strictly confidential.

This first section contains demographic and some lifestyle questions related to stress. We would be grateful therefore if you could answer all questions. However you will see that many questions have a 'n/a' (not applicable) option if none of the answers are appropriate, or if you prefer not to answer for any reason. Similarly you can write 'n/a' in any of the comments boxes if you prefer not to answer.

Please remember that once you have clicked on the CONTINUE button at the bottom of each page you can not return to review or amend that page

Section 1A General demographic questions

1. Please enter the participant ID number you were given.

More Info

2. Please enter roughly what time it is now (e.g 10am, 9.15pm etc)

3. What is your gender?

☐ Female ☐ Male

4. Please enter your date of birth. *(Please note the year box pop up window below only displays a narrow range of years at a time. To see years before or after those shown, click on the top or bottom year as appropriate, and repeat this procedure until you get to the correct year range.)*

 (DD-MM-YYYY)

5. How would you describe your ethnic origin? Please tick one.

- ☐ White British
- ☐ Any other white background
- ☐ Asian British
- ☐ Any other Asian background
- ☐ Black British
- ☐ Any other Black background
- ☐ Mixed British
- ☐ Any other mixed background
- ☐ Chinese British
- ☐ Any other Chinese background
- ☐ N/a
- ☐ Other (please specify):

6. What is your current marital status? Please tick one.

- ☐ Currently married and living together, or living with someone in marital-like relationship
- ☐ Single
- ☐ Separated / divorced / formerly lived with someone in a marital-like relationship
- ☐ Widowed
- ☐ N/a
- ☐ Other (please specify):

7. Do you live in a:

- ☐ House ☐ Flat ☐ Bedsit ☐ Hostel or Hall of Residence ☐ N/a
- ☐ Other (please specify):

8. How many people live in your home (including you)?

9. How many children do you have?

Select an answer

10. How many children under the age of 18 live in your home?

Select an answer

11. How many children of 18 or over live in your home?

Select an answer

12. What is the age of the youngest child living in your home, if any? (Please insert 'n/a' if no children)

13. What is your highest level of educational qualification? Please tick one.

- ☐ None
- ☐ CSE's or equivalent
- ☐ GCSE's, O levels or equivalent
- ☐ A/AS levels or equivalent
- ☐ Degree (BA, BSc or equivalent)
- ☐ Postgraduate degree (MA, MSc, MPhil, PhD)
- ☐ n/a
- ☐ Other (please specify):

14. How many hours a week do you usually work at your place of work?

15. How many hours a week do you work at home, on average?

[More Info](#)

16. What is your University of Bath job grade?

Select an answer ▾

17. What type of department or function do you work in?

Select an answer ▾

If you selected Other, please specify:

Section 1B Health and lifestyle related questions

18. How is your health in general? (NB This refers to both physical and/or psychological well-being).

- very good
- good
- fair
- bad
- very bad
- n/a

19. Do you smoke cigarettes regularly (i.e. on a daily basis)?

- yes, current smoker
- no, ex regular smoker
- no, never or hardly ever smoked
- Other (please specify):

20. If you are a current smoker, on average how many cigarettes do you smoke on a week day?

If you don't smoke, please enter *none*

21. On average how many days a week do you take some form of exercise?

Select an answer ▾

22. Do you or have you ever kept a regular diary (i.e. of events that have happened each day)?

- No, never
- Yes, but a long time ago
- Yes, relatively recently
- Yes, currently
- Other (please specify):

Continue >

This was followed by the scales below in the order shown:

PNES – 12; PSS – 10; COPE – 28; SES – 12; GSE – 10; LOT-R – 10; TIPI – 10; NCS – 18; GOSS – 6; ISEL – 12; HINT – 12.

3-i Training – Online Questionnaire 1



Page 15 of 15

End of Survey

Thank you very much for completing this survey.

You will be contacted within the next few days to arrange for you to receive your skills training manual. If in the meantime you have any questions, please email Steve Dean (s.dean@bath.ac.uk). Thank you.

Appendix C6: Study 1: Training activity summary instructions

3-i Training Activity summary instructions

Getting started!

This training programme aims to help you develop regular thinking practices that should increase your skill in overcoming problems. You should hopefully find them easy and useful once you get the habit. To help you get started, we suggest you follow these steps:

1. Decide when and where you are going to read through the instruction manual. Rather than trying to read it all in one go, as there are 3 levels, you might find it easier to digest if you just read one level at a time.
2. Think about your week ahead and note down (e.g. in a diary or somewhere prominent) the three evenings (ideally spread across the week) when you plan to do the activity sessions. Repeat this for each successive week.
3. Though each session is only 20 minutes, you will need to think through your evening and consider how you are going to fit it in. Prepare what you need, set a time for the session and stick to it. You don't need to commit to the full 20 minutes every session. Just commit to at least picking up your pen and making a start. Thereafter just write for how long feels comfortable.
4. The best time to think and write is ideally when you are calm and relaxed shortly before going to sleep. Try to ensure that there are no distractions, i.e. so that you can think and write freely for about 20 minutes.
5. At the end of each session, please note the start and end time and the type of activity on the **activities record form**. Whether you do more or less than 3 sessions each week, or more or less than 20 minutes per session is your choice, as is whether you write your notes by hand or on a laptop etc. It's about discovering what works best for you.
6. At the end of each week, please transfer the contents of your **activities record form** to the online version of the form and email it to s.dean@bath.ac.uk. If this is not feasible for any reason, please bring the completed paper version of the form with you to the completion meeting at the end of the study. You can start 'week 1' on any day you choose.
7. A key aim of this study is to discover the amount and frequency of practice that is **sustainable** for participants. We recommend that you start with the suggested three 20 minute sessions per week for the first couple of weeks. Thereafter try to decide on a pattern of use that you think will work for you. This could for example range from a single long weekly session to e.g. much shorter sessions e.g. most nights, just like keeping a diary. To develop and maintain the benefits, you need to find a level of activity that you can sustain. Otherwise you are likely to drift back to old patterns of thinking, particularly in times of stress.

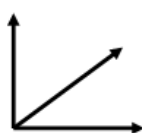
Thank you for taking part and good luck.



3-i Problem-Solving

applied to stress

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Introduction

This training programme sets out a framework of problem solving skills and activities, which can be applied to many issues. In this programme the emphasis is on stress reduction, which is achieved through increasing your control over key aspects of your life. This programme involves three types of action: **thinking**, **noting** and **doing**. The first two are the focus of this guide. They are essentially about planning and require about an hour a week to perform. The 'doing' is then implementing whatever you have planned. Though the guide may at first glance seem quite long, it is very straightforward. We suggest you initially focus on levels 1 and 2 to get the general gist. Level 3 is a reference section for later use.

Level 1 – General Principles

This gives you a brief overview of the nature and aims of the training programme. It outlines the key skills and associated activities and explains how they can help combat stress and enhance psychological and physical well-being. It also emphasises the importance of regular practice to reinforce more effective ways of thinking and acting. You may find it useful to occasionally re-read this section to keep a clear sense of purpose in mind.

Level 2 – The Core Programme

This is the main level to focus on. It begins with a brief examination of the nature and causes of stress. It then sets out a series of inter-linking skills and activities under three 'intelligence' headings: perceptual, strategic and tactical. (These are the 3-i's of the programme title.) **Perceptual intelligence** addresses how you assess or interpret situations, particularly problems. **Strategic intelligence** addresses your choice of goals and how you achieve them. **Tactical intelligence** focuses on day to day problem-solving, i.e. facilitating progress towards goals. The 3-i problem-solving approach integrates these three types of intelligence in a systematic way to provide a simple but comprehensive means of overcoming problems and reducing stress.

Level 3 – Extra Help – useful tips & ideas

This provides further insights and guidance on approaches that you may find helpful, when later applying the techniques. We suggest you initially just familiarise yourself with the contents. Your main focus should be on level 2. You can 'dip into' level 3 later as and when you need extra ideas for handling particular issues.



Level 1 – General Principles

The 3-i problem-solving skills

What kinds of skill are involved?

The skills consist of a range of ideas and activities which together provide a systematic way of helping you make progress towards your goals.

How can this help with stress?

Stress is what we experience when we perceive that the demands of a situation exceed the resources available to us to meet those demands. This state leaves us feeling overstretched, sensing we may not be able to achieve the relevant goal or goals we have set ourselves. Increasing our capacity to progress towards goals, particularly the most important, therefore helps alleviate stress.

How exactly do the skills work?

The skills work by addressing three areas of thinking which have a fundamental impact on our capacity to achieve goals and hence our susceptibility to stress.

1. Perceptual intelligence skills

As stress responses are triggered by perceptions of problems or challenges, which may not necessarily be accurate representations of the underlying reality, 'perceptual intelligence' skills address the accuracy and reliability of perceptions when appraising people, situations, problems etc. Perceptual intelligence can help lower stress and enhance goal progress in two ways. Firstly it can help reduce the triggering of stressful 'false alarms' or over-reactions caused by hastily jumping to wrong conclusions. Secondly it can help you devise more appropriate effective solutions to problems, by basing them on more considered assessments of the challenges faced and the options available.

2. Strategic intelligence skills

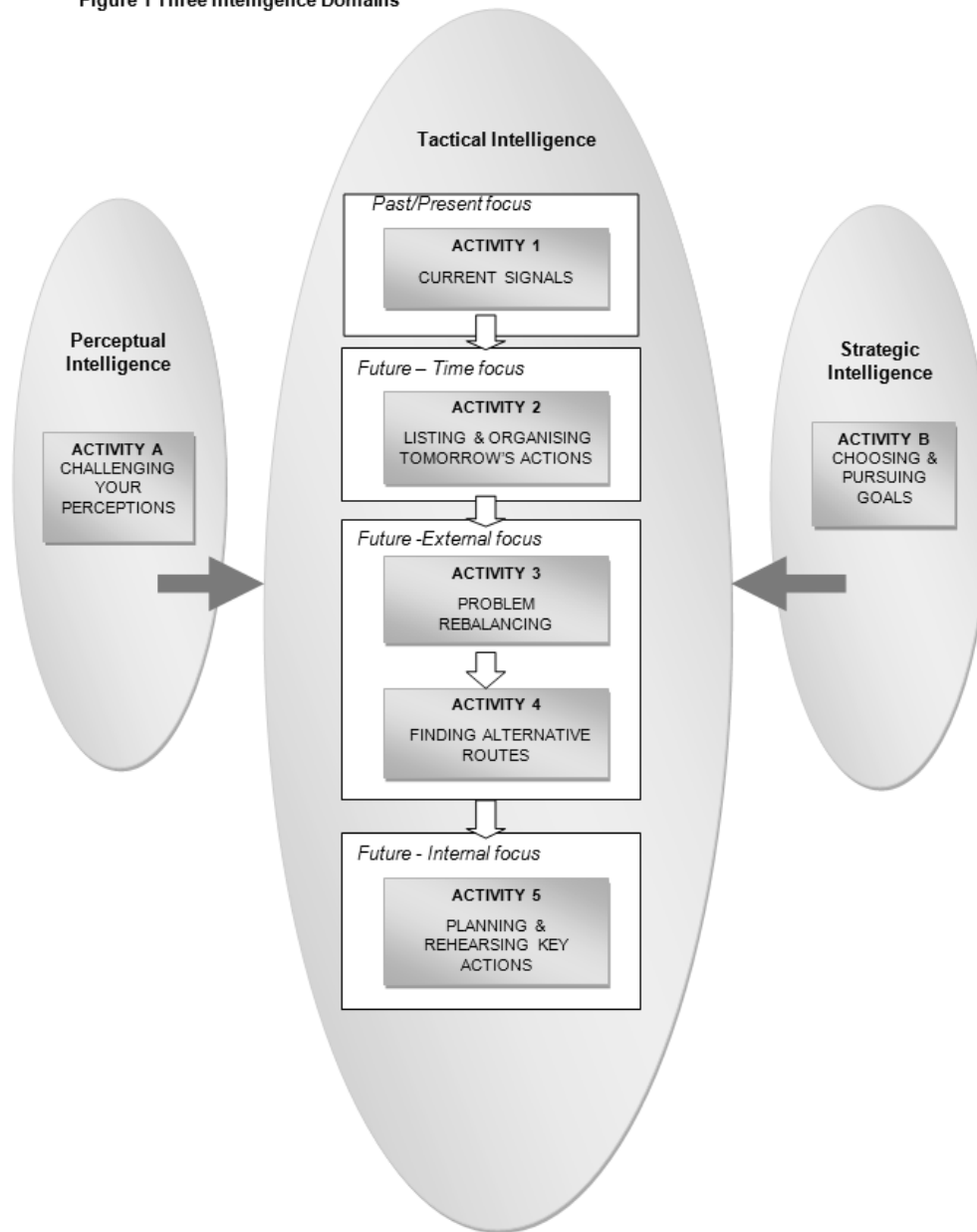
As the amount of stress we encounter is largely determined by the nature and number of goals we choose to pursue, 'strategic intelligence' addresses the implications of different types of goal choice and our means of achieving them. Stress often stems from chasing too many goals and perhaps losing sight of what's really important. Not all goals we set ourselves are achievable or necessary. Sometimes we chase things we don't even really want. Much of the thinking in this category therefore is about focus, clarity and prioritisation.

3. Tactical intelligence skills

'Tactical intelligence' refers to the organisation, flexibility and ingenuity with which you set about achieving the goals you have decided to pursue. This involves clear thinking, effective planning, adaptability, creativity, resourcefulness and resilience in overcoming obstacles. The more you develop such skills, the less threatened and stressed you should feel whenever things don't work out as planned.

As indicated in Figure 1 on the next page, the 'tactical intelligence' domain constitutes the core of the training programme and has the most activities. This reflects the fact that the problems we most regularly face and the choices we have to make are 'tactical' ones. Though less time is directly devoted to the other two domains, they are crucially important, as tactical thinking is continually informed and guided by insights from both perceptual and strategic intelligence.

Figure 1 Three Intelligence Domains



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Health benefits

What impact will using these skills have on my health?

There are two aspects of your health that should be enhanced by improving your capacity to progress towards goals:-

1. Psychological or mental well-being

Progress towards goals creates positive thoughts and feelings, whereas blocked or inadequate progress creates negative thoughts and feelings e.g. panic, worry, anxiety, anger, frustration etc. Increasing your capacity to progress towards your goals should therefore create more positive and fewer negative emotions i.e. making you feel happier.

As an illustration of what to aim for, someone who has regularly practised and mastered the skills outlined in this programme might be described as "perceptive, knowing exactly what they want from life and how they are going to achieve it, enjoying challenges, unperturbed by problems, taking setbacks in their stride, confident in the knowledge that what's most important is within their control."

2. Physical well-being

Negative emotions associated with blocked, frustrated or threatened goals trigger a range of physiological stress responses e.g. increased heart rate and blood pressure and the release of stress hormones such as cortisol and adrenaline. In short bursts these reactions are not necessarily problematic and may even be beneficial. However if the stress persists over months and years, repeated triggering of these physiological responses can contribute to a wide range of physical health problems. By reducing the frequency and severity of stress responses to everyday problems, this training programme should help reduce the long term impact of stress on your body.

How does this compare to other types of stress management training?

There are 4 distinctive features of this training programme:-

1. **Comprehensive approach** – The training programme tackles the root cause of stress in three fundamental ways i.e. via perceptual, strategic and tactical choices. It also seeks to improve both physical and psychological well-being.
2. **Clarity** – The programme provides you with a single objective i.e. increasing your capacity to progress towards your goals, and provides a clear method and flexible range of tools to achieve this.
3. **Sustainability** – As stress is a life-long issue, a long term solution is required. The activities in this programme are designed for sustainability, in that they require little time or resources and can be easily integrated into everyday lifestyles. They are a simple way of helping you get more of what you want out of life.
4. **Evidence-based** – The full implementation of the training programme includes before and after measurement of stress hormones and psychological well-being to provide objective evidence of benefits to participants.



Importance of practice

So what exactly do I need to do?

Once you have familiarised yourself with the thinking/noting techniques, you should aim to practise them three times a week, for 20 minutes each session. This involves applying the problem-solving techniques to particular issues you are facing and noting down your proposed solutions. The ideal time for these thinking/noting sessions is in the evening, just before going to bed, like you might write a diary.

Why is noting things down important?

Numerous studies have found health benefits associated with writing about important issues. The writing process appears to help clarify thoughts and develop insights. It helps you capture fleeting ideas or sources of inspiration. It enables you to keep track of more complex chains of thought. It also facilitates clear commitment to specific courses of action.

Why is thinking in different ways important?

Much of what we think, say and do every day is habitual i.e. we just repeat learned patterns of behaviour on a kind of auto-pilot setting. If the auto-pilot (existing patterns/habits) is taking us where we want to go, that's fine. If not, then we need to take more conscious control and steer a different course. There are many different routes we could take and more creative, effective ways of doing things, every moment of our lives, but we won't take advantage of them unless we think of them. And we won't think of them unless we devote some time and effort to this.

What if I don't consider myself very creative?

In this training programme, 'creativity' is simply about considering alternative ways of tackling issues. No special talent is required. You just need to be open to the idea of looking beyond a single fixed way of viewing anything. The programme then provides you with various techniques (see Level 3, section 3.1) to expand your thinking and help generate a broader range of options than you might originally have considered.

How long do I need to do it for?

As mentioned above, the programme is designed for sustainable long term use. Clearly it will take some time to get to grips with and fully exploit the various activities. It is estimated however that after 3 to 4 weeks, you should have established a pattern of use that works for you and feels quite natural. By this time any benefits should become apparent. Thereafter it's up to you whether you would like to continue or not. You can of course stop at any time, but as with anything the more effort you put in, the greater the likely benefit.

What if I'm really busy/stressed and feel I don't have time to do this?

If that's the case, you stand to benefit most from this programme, as the activities are designed to save you time and reduce pressures. The programme won't take much of your time and you don't have to do all the activities. This is not an 'all or nothing' affair. You can just dip in and use what you need. Whatever the source of stress, there should be a tool here that can help. When you are particularly pressed for time, you might just want to try tactical intelligence activities 1 and 2 (explained later). They are very straightforward and should easily gain you more time than they take to do.



Level 2 – The Core Programme

Overview

The core programme begins with a brief explanation of the nature of 'stress'. It then illustrates the 3 types of intelligence you will be practising:

- Perceptual intelligence
- Strategic intelligence
- Tactical intelligence

There are seven activities to choose from. The first two, perceptual and strategic intelligence, cover thinking skills that support and reinforce the effectiveness of the five tactical intelligence activities. Instructions for each thinking/noting activity are highlighted in the type of text box shown below.

Thinking/noting activities

- A. Challenging your perceptions
- B. Choosing and pursuing goals

1. Current signals – red, green or amber.
2. Listing and organising tomorrow's actions.
3. Problem rebalancing.
4. Finding alternative routes.
5. Planning and rehearsing key actions.

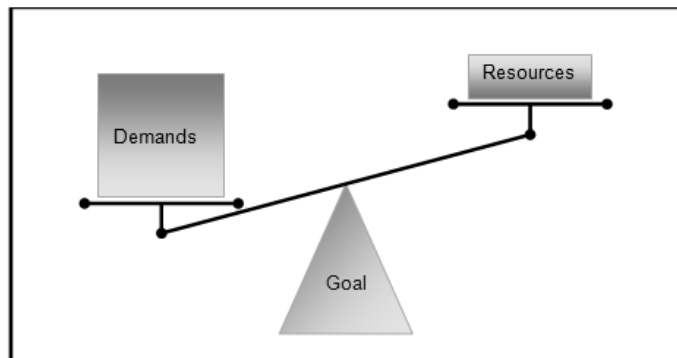
Key points you will need to remember from the core programme:

- You should aim for a minimum of three 20 minute thinking/noting sessions per week. This should ideally be at the end of the day just before you go to sleep, like writing a diary. You should be calm and relaxed, with no distractions.
- Activity A gets you to challenge your perceptions and can be integrated into any of the other activities. Activity B gets you to think about your life goals. We recommend you start with Activity B for your very first 20 minute session, as it serves as a platform for Activities 1 to 5.
- Activities 1 to 5 are the ones you will most regularly use. Activity 1 reviews your current situation and will therefore be the logical starting point for most sessions. Activity 2 is also likely to be of regular use. Need for Activities 3 to 5 will vary depending on the situations you face. You can choose whichever activity you feel most appropriate for each thinking/noting session.
- Your writing should flow with complete sentences, demonstrating clear lines of thought. It should be clearly legible to you. Don't worry about grammar or spelling however. The writing is just for your benefit.
- Finally particularly for Activities 1 to 5 remember the sequence: **thinking → noting → doing**. To derive optimal benefit from these thinking/noting activities, you have to put them into **action**. Also the more effort you put in, the greater the benefits.

Stress Model

The aim of this programme is to provide you with a set of problem-solving skills to help pinpoint the root causes of stress in your life and enable you to make choices to reduce that stress. A key element is the provision of simple models to help clarify complex issues. Stress for example [See Figure 2 below] can be viewed as an imbalance (real or imagined) between demands and resources in pursuit of a particular goal or goals.

Figure 2 Imbalance of Demands versus Resources



This model can be applied to all sources of stress. Two particularly common sources are:

1. **Task-related stress** – This is where you perceive that the demands placed upon you e.g. in terms of workload, obligations, duties etc., exceed the resources available to meet those demands (e.g. time, money, skills, information, help from others etc.). The problem may be real, imagined or just a question of uncertainty. All three possibilities however can trigger stress responses and thus need to be addressed.
2. **People-related stress** – Again this involves a perception, reality or uncertainty about demands exceeding your resources. However the perceived gap here is between your expectations about how you would like to interact with other people and your ability to achieve this. This interaction includes both how you relate to others (e.g. feeling and appearing confident, competent etc.) and how others relate to you (e.g. how they perceive, treat you etc.).

Whatever the source, if we recognise that stress in general stems from a **perceived** imbalance of **demands** versus **resources** in pursuit of a particular **goal**, then there are 4 logical ways of reducing that stress:-

1. Revising our **perceptions**
2. Reducing **demands**
3. Increasing **resources**
4. Revising our **goals**

These 4 ways of reducing stress relate directly to the 'intelligence' domains outlined in the pages that follow. Number 1 corresponds to 'Perceptual intelligence'; number 4 to 'Strategic intelligence' and numbers 2 and 3 to 'Tactical intelligence'.



Perceptual Intelligence

'Perceptual intelligence' refers to the sophistication and flexibility of your perception when assessing people, situations, problems, solutions etc. It is based on the principle that the human brain doesn't simply absorb everything from the world around us and present it in a neutral balanced way. Rather the brain is constantly filtering, focusing on some things, ignoring others and piecing bits together to try to make sense of what's happening, has happened or might happen.

Appreciating that the brain is more a speculative 'guessing machine' than a faithful 'recording device' can help us better interpret our impressions. The more accurate these are, the better the chances of responding appropriately and making the most of any situation. The key foundation underpinning 'perceptual intelligence' is realising that we don't react to what we see, but to how we interpret what we see, and to a large extent this is a matter of choice or habit. The more complex the issue the greater the potential role and value of perceptual intelligence.

Over time through repeating similar patterns of perception and interpretation, our views about ourselves, others, the past, present and future can become fixed and inflexible. We recall supporting evidence and discount contradictory evidence as 'exceptions'. We also tend to resist other people's challenges to our views, particularly where this might involve loss of face, having to acknowledge that we are wrong.

The activity below gives you the opportunity to challenge your views in private, without loss of face. By opening your mind to alternative possibilities and different ways of viewing things, you should develop deeper insights and generate more potential solutions. The more flexible your thinking, the more resourceful you become.

Activity A – Challenging your Perceptions

1. Being ready to challenge your initial thoughts/impressions – This is about adopting the right frame of mind. Remember how the brain works. Acknowledge that impressions are not necessarily correct. Resist jumping to automatic conclusions. Try to approach situations, people, opportunities etc with more of an open mind. This gives you more options for action and potential solutions to problems and ultimately more control.

2. Monitoring your ways of thinking – For a particular problem or situation you are facing, consider what aspects of the situation you are focusing on (information selection) and how you are thinking about them (information processing). [See Level 3 Appendix, section 1.1 for possible biases in your thinking.] Note down the facts of the situation. How are you interpreting those facts? Could they be interpreted differently? Are there other facts you have so far ignored? Have you considered the viewpoints of other people involved? How might they be thinking or feeling about the situation? What don't they know? What might they be assuming or even getting wrong? By acknowledging the choices and possible limitations in your thinking, you should recognise other possible ways of seeing or making sense of your situation.

3. Choosing more useful ways of thinking – Once you are aware of your way or style of thinking, you are in a position to choose more effective ways. Level 3 Appendix section 1.1 suggests remedies for common thinking biases. Generally you should find you'll make better progress towards your goals the more your thinking is:- open minded rather than closed, flexible rather than fixed, constructive rather than defeatist, pragmatic/realistic rather than fanciful/wistful, systematic/organised rather than haphazard/sporadic, present or future focused rather than past, addressing what can rather than cannot be changed.

4. Noting conclusions – Working through the previous steps should provide you with a more objective, balanced view of your situation. Note this down. If there are key things you need to clarify, note down what you need to find out and how and when you are going to do this.

Note: Insights from this activity can be applied in Activities 1 to 5.

Strategic Intelligence

'Strategic intelligence' refers to the sophistication and flexibility with which you set about achieving what you want from life. The goals you set yourself at the strategic level, i.e. what you identify as your priorities in life, will shape the challenges you face on a daily basis, particularly any stress. Thus the more effort you put into your 'strategic thinking' the easier your day to day tasks should become. Activity B below helps you address what goals to choose and how to achieve them.

The simple answer to stress is that you can't do everything. You need to prioritise. This means deciding what's important and letting go of what's not. A simple way of doing this is to think of your life in terms of a goal hierarchy (shown opposite) consisting of your 'ideal self' at the top, then primary and secondary goals. The activity below explains how to use this idea of primary and secondary goals to help develop your resilience to stress.



Activity B – Choosing and Pursuing Goals

1. Establishing your own goal hierarchy: Describe your 'ideal self/situation' that you want to work towards and believe you can realistically achieve. This can be expressed in terms of 'primary goals' for various domains of your life (e.g. self image, health, relationships, finances, work, etc – see Tables 2, 3 and 4 in Level 3 Appendix for more detail).

2. Choosing the 'right types' of goals: Your ability to achieve goals doesn't just depend on having a clear structure (e.g. domains and levels). It is also greatly influenced by the nature of the goals you choose to pursue. There are a number of useful distinctions listed below which should help clarify your thinking. They are explained in detail in the level 3 appendix, section 2.2.

- Abstract versus concrete goals
- Internal versus external goals
- Process versus outcome goals
- Approach versus avoidance goals
- Unlimited versus limited resource goals

3. Choosing a balance of primary goals: It is important to try to get a balance and not neglect a key domain of your life. This helps if you have a setback in one particular domain. Inevitably if you are pursuing several domains, it is unlikely that you will be able to satisfy every possible goal in each domain. You therefore need to prioritise. Identify the most important goal in each domain, the very minimum you want to safeguard or achieve. Where goals are in conflict, give priority to those most consistent with your core values/ideal self i.e. what you see as most important to you and your life.

4. Choosing secondary goals: Once you have clarified your primary goals, consider diverse means (i.e. secondary goals) by which each of your primary goals could be achieved. As explained in level 3, section 2.2, the more abstract or flexible your primary goals, the more choice you should have in terms of secondary goals. Decide and note down the specific secondary goals you intend to pursue. As setbacks are inevitable in life, also note possible alternative routes (i.e. as contingency plans).

5. Reviewing and adapting: Regularly review your activities. Map them onto your goal hierarchy. Identify the primary goals these activities are supporting. Are they your key priorities? Are there better routes (secondary goals) to achieving your primary goals? Are there activities you can drop? Building flexibility into your goal hierarchy will help develop your resilience to stress, i.e. if things don't work out as initially planned. Try to view dealing with set-backs as a kind of creative challenge.

Note: Insights from this activity can be applied in Activities 1 to 5.

Tactical Intelligence

This is the core of the training programme containing the five activities you should regularly focus on. As illustrated in Figure 1, the 'perceptual intelligence' and 'strategic intelligence' skills outlined above should contribute to and enhance the effectiveness of the core activities outlined in this section.

The five 'tactical intelligence' activities (see Table 1a below) are designed to increase your capacity to progress towards your goals on a daily basis. They are organised in an incremental fashion, i.e. starting with simple issues/problems and then progressing to more complex. This reflects the fact that you don't face major problems every day. Usually when reviewing your situation (Activity 1) achieving your immediate goals should just be a question of organising your time (Activity 2). So activities 1 and 2 are the basic activities you should regularly be using.

Often however stress stems from the fact that we don't seem to be able to squeeze everything we need to do into the time available. When this is the case, it is necessary to find ways of shortening or simplifying tasks or increasing access to useful resources (Activity 3). If this is not possible you may need to take more significant, imaginative steps to overcome the problem. This involves working with your goal hierarchy to consider alternative ways of achieving your objectives (Activity 4). Sometimes implementing your plans may be relatively straightforward. However when the required action is something novel or difficult, it will help to think through and rehearse what you have decided to do (Activity 5).

Table 1a Incremental Scale of 'Tactical Intelligence' Activities

Activity	Description	Explanation
1	Current signals – red, green or amber	Clarifying starting position – where am I now?
2	Listing & organising tomorrow's actions	Improving use of time
3	Problem rebalancing	Minor tactical changes to overcome problems
4	Finding alternative routes	Major tactical changes to overcome problems
5	Planning and rehearsing key actions	Turning thoughts into actions

This may seem a lot to take in initially. However each activity increases your options for overcoming problems. Once you are familiar with the activities, you should find them straightforward. You can use any of the activities in the recommended three 20 minute 'thinking/noting' sessions per week. We suggest you start each session with Activity 1, which reviews your current situation and then combine it with whichever follow up activity or activities suit your needs.

Though lists of instructions are not the most exciting of reading materials, it's what you do with them that counts i.e. when you apply them to your own situation and start seeing new possibilities. The more you invest in these activities, the more creative you are, the more control you will exercise over your life. This need not be confined to reducing negatives (e.g. stress). You can also use the activities to generate more positive life experiences (e.g. fun, enjoyment, satisfaction). See the 'green' and 'amber' sections of Activity 1 below.

As you apply the various problem solving techniques and activities, remember we can't have everything we could possibly dream of in life. With limited time and resources, this inevitably means having to make trade-offs and compromises. Fortunately however what's most important for well-being is well within the grasp of most people, provided of course we recognize what it is and set about achieving it in the right way. Research on well-being highlights two key priorities that shouldn't be sacrificed for short term gain. These are (i) having a **positive self-image** which stems for example from acting in a decent, responsible way, and (ii) **positive relationships**, which e.g. stem from respecting and treating others well.

Activity 1 – Current Signals – Red, Green or Amber

This first activity is about understanding your present situation, particularly any problems that might be affecting your mood. A common reaction to a difficult day is just to want to switch off, perhaps vegetate in front of the TV. Though this might provide momentary respite, it doesn't solve anything. The problem is still there. With no shortage of distractions, many of us never seem to find the time to properly address problems. We just live with them hovering in the background, clouding our horizons, souring our mood.

This activity gets you to take 20 minutes to think clearly and constructively about any problems you might have encountered during your day. Key to this process is understanding that goals and emotions are inextricably linked. Progress towards goals generates positive emotions (e.g. happiness, satisfaction, pride). Blocked or inadequate progress generates negative emotions (e.g. anger, frustration, anxiety). This link can help guide you to solutions. Emotions are a type of signalling device like traffic lights; positive emotions (green) signalling when we're doing well, on the right track; negative (red) warning when progress is threatened or blocked and we perhaps need to take action. Amber when things are neither particularly good nor bad.

Like traffic lights however, emotions are just basic signals. A negative feeling tells us something's not right, but the root cause may not necessarily be clear. To identify the cause, some detective work is required. This involves linking your emotions to underlying goal states and noting how these goals fit into your goal hierarchy. This in turn clarifies their importance and possible remedies. Thus instead of simply wallowing in negative feelings feeling sorry for ourselves, this activity gives us the tools to do something about it.

There are three versions of Activity 1. Depending on whether your mood is predominantly red, green or amber, follow one of the three sets of instructions below.

Activity 1 - Red - Negative emotions - Frustrated/threatened goal progress

1. Noting initial thoughts/feelings – Note down your initial thoughts and impressions about anything that prompted or caused your negative feelings about today. This might for example be related to a particular encounter or outcome, the way you handled something or an on-going problem.

2 Applying 'strategic intelligence' to the perceived problem – Try to identify what goal(s) the problem relates to. Note your current state of progress towards the goal(s). Negative emotions would imply progress towards the goal appears to have been threatened or blocked in some way. Is it a primary or secondary goal? How important is it in the 'big picture'? Is it something you can drop or find an alternative to?

3. Applying 'perceptual intelligence' to the perceived problem – If an important goal is at stake, you will need to think more deeply. Applying perceptual intelligence (See Activity A) will help clarify issues and provide the groundwork for later solutions. For example try to distinguish between facts and perceptions. Consider possible thinking biases, alternative viewpoints or interpretations, possible sources of confusion or misunderstanding etc.

4 Next steps – Decide and note down what you are going to do next e.g. ignore the problem as trivial, gather more information, or apply whichever problem-solving techniques (activities 2 – 5) you think most appropriate e.g. organising your time, problem rebalancing etc.

Activity 1 - Green - Positive emotions - Goal progress

- 1. Noting initial thoughts/feelings** – Note your initial thoughts and impressions about anything that prompted or caused your positive feelings.
- 2. Applying 'strategic intelligence'** – Identify the particular goal or goals that this relates to and where they are located on your goal hierarchy.
- 3. Recognising source of success** – What role did you play in making this happen i.e. in particular what did you do well? How exactly did you do this? What if any was the 'magic ingredient'? Again 'perceptual intelligence' will be useful here.
- 4. Next steps** – Think through how you can build on this or do more of this in the future. Note down a concrete action you can take to make this happen and when you'll do it. Action is essential. Remember the sequence: **thinking → noting → doing!**

(NOTE: If only one type of emotion was salient, then focus on that. If there were both positive and negative, you can address either or both. If the day provoked neither positive nor negative feelings, then apply the activity below.)

Activity 1 - Amber – Emotionally neutral – Need for action on key goals

- 1. Turning amber to green** – If there was nothing particularly positive about today, then to turn your amber light to green, the challenge is to think what you can do to make more significant progress towards one or more of your primary goals.
- 2. Enjoying the challenge** – Be creative and have some fun with this. It can be as big or as small as you like. It might just be a simple step in a new direction e.g. developing an interest or skill, or a kind gesture towards someone you care about. The key is to think of something.
- 3. Next steps** – Note down the concrete action you are going to take and when you'll do it. Remember: **thinking, noting, doing!**

(NOTE: You can write as little or as much as you want. The key for these red/green/amber activities is to generate useful insights that you can put into action.)

Activity 2 – Listing and Organising Tomorrow's Actions

This activity is about taking more control of your time. Time is our most precious resource and yet so easily squandered. It is possible to drift through life, exercising little conscious control, repeating the same routines, responding to other's agendas, never quite fulfilling our own. It is also possible however to take more control of your life, grabbing hold of each day, deciding what you want to get out of it and setting your own agenda. The choice is yours.

The activity below is designed to get you to think about how you want to use your day. Just a little forethought can make a huge difference. Thinking ahead can avoid last minute rushes. A simple note can help you avoid forgetting something crucial. A bit of imagination can bring colour to a dull routine.

The overall aim is that you should start each day with a clear sense of purpose, knowing exactly what you want to get out of it and how you're going to achieve this. The instructions suggest making your notes on a small sheet of paper (e.g. A5 size – half A4), which you can then carry around like a shopping list, as a prompt to remember what to do and when. If however you prefer using some form of electronic personal organiser, then please use whatever you think will work best. You can apply this activity every day or just to particular days. You can also apply it to weekly, monthly planning etc.

Activity 2 – Listing and Organising Tomorrow's Actions

1. Drafting basic outline – Note down, from morning to evening, key things that are already time-fixed across the day e.g. specific meetings, appointments etc. Also note anything key things you need to remember e.g. numbers, names, times etc.

2. Deciding minimum objectives – For elements of the day over which you have some control, decide your priority actions, i.e. the minimum essential goals you want to achieve. Importantly this also means deciding what you won't do, i.e. that you can drop or postpone. Try not to focus on just one goal domain to the exclusion of all others. Also try to ensure you devote attention to what's important to you rather than just urgent. (See 'importance v urgency' note in level 3 appendix, section 3.2)

3. Getting organised – For your priority actions, think through exactly how when and where you will do them and what you will need to have with you. Note timings and anything you need to remember. Be realistic with your timings.

4. Optimising use of time – Once you have your priorities noted, consider if there are any ways you can gain time. For example is there something useful you can do while you're waiting for someone or something? Are there little things you keep postponing or forgetting to do (e.g. from other goal domains) which you could perhaps combine with a planned activity? Is there an optimal order for activities that will save time? (Note: This doesn't have to be exhaustive. It's just about thinking ahead and making a few gains from being better organised.)

5. Using prompts to stay on track – Remember to carry the sheet of paper (or other prompt) around with you. Get into the habit of regularly checking it to stay on track. It's your day, your time, use it well.



Activity 3 – Problem Rebalancing

Sometimes simply managing your time and organising actions are not enough to get you where you want to be. The demands on you and your time may appear greater than the resources available to you. If there is no obvious solution, a common tendency is to get stuck, seeing things in a fixed way, succumbing to negative emotions e.g. panic, anger, frustration etc. There may be solutions out there, but you just can't see them.

The activity below helps you generate solutions. It looks for subtle ways of easing your way past problems, by highlighting actions you can take to reduce demands and increase resources i.e. redressing the balance in your favour. It does this in a systematic way, so as not to miss out on possible solutions. Before starting this activity you should have a clear and balanced understanding of the problem you are facing and the goal or goals it relates to i.e. from Activity 1.

Activity 3 – Problem Rebalancing

1. Reducing demands – Use your imagination to generate ideas for ways in which the size or nature of the problem might be reduced. The more systematic you can be the more options you are likely to discover. A useful way to structure your thoughts is to work through the following headings:

- **Internal demands** – To what extent are the demands of the problem a function of your own expectations for yourself? Here it might be useful to consider the concept of 'satisficing' as opposed to 'maximising' i.e. being content with something that is 'good enough' as opposed to 'perfect', particularly for peripheral issues. Compromise is important. We tend to have a mental picture of what we're aiming for. If the complete picture is unattainable, the core essence might still be, if we're prepared to give up on some of the peripheral detail.
- **External demands** – To what extent are the demands externally imposed? With a work based problem the demands might be imposed by your boss. If there's uncertainty you may need to test your assumptions about just what exactly is required. If it's clear what your boss expects and you feel this is too much, try to negotiate. What are the priorities? What are possible areas for compromise?
- **Time demands** – If time is tight, don't just automatically accept deadlines you've been given. Question the time scales. Just what exactly is needed by when? Try renegotiating deadlines wherever feasible. Search for possible compromises. It might not work in all situations, but it should in some. So give it a try.

2. Increasing resources – Note down ways in which your resources might be greater than you think or could be increased. Again try to work through your options in a systematic way:

- **Internal resources** – These might include your knowledge/know-how; personality attributes e.g. perceptiveness, perseverance, resourcefulness, sense of humour, organisational ability etc; work or technical skills; social skills e.g. being able to seek/accept help from others. The solution may be simply to recognize and make more use of your existing resources or to develop additional resources/skills. (NB The more resources you can develop through life, the greater your resilience.)
- **External resources** – These include accessing possible sources of information; help or support from family, friends, work colleagues, support groups, public services/agencies etc.
- **Time resources** – Try to identify ways you might be able to use your time more efficiently. Don't just dive into tasks. Try to think things through beforehand to figure out the best approach.

3. Being creative – Try to think of novel approaches, things you might not have tried before. Don't be too quick to reject ideas. If sceptical about a possible course of action, focus on how you could make it work. Try out new approaches. Experiment a little. Have some fun with this!

4. Next steps – Whatever solution you decide upon, note down what exactly you're going to do and when. Action is essential. Remember the sequence: **thinking → noting → doing!**

Activity 4 – Finding Alternative Routes

If better management of your time or problem rebalancing haven't provided an adequate solution to a problem/blocked goal, then you need more radical thinking. This means finding different routes around the problem (i.e. alternative secondary goals). In reaching this point you should be clear about what goal or goals the problem relates to (i.e. from Activity 1).

Activity 4 – Finding Alternative Routes

1. Different secondary route - same primary goal – If the blocked goal is a secondary goal, note the primary goal it is supporting. What is the core of that primary goal? Consider other ways i.e. alternative secondary routes by which that goal could be achieved. The more abstract and less specific/rigid your definition of your primary goals, the more flexibility you will have in choosing secondary goals/routes. Illustrations are provided below for two types of problem commonly cited as sources stress:

- **Task-related problem** – An example might be trying to pass a difficult professional qualification / exam. If you felt unable to achieve this through time management or problem rebalancing, an **alternative route** approach would first involve considering the primary goal this is supporting. The primary goal might for example be 'to develop a sense of competence/confidence in what you do'. An alternative secondary route towards this primary goal might for example be to develop your work skills more informally on the job itself, e.g. learning how more highly skilled colleagues perform particular tasks.
- **People-related problem** – e.g. not getting on with someone. Here the underlying primary goal might for example be to 'develop close and supportive friendships'. An **'alternative route'** approach (e.g. if problem-rebalancing has not yielded a satisfactory solution) may be to invest more in other friendships where your efforts might be more appreciated.

2. Being creative – Try to think of novel approaches, things you might not have tried or considered before. Look at the situation from different angles or perspectives. For example how might someone you admire tackle the problem? If you can't think of anything immediately, resolve to do something that might help e.g. talking to others, a change of environment to get a fresh perspective.

List as many alternative options as you can. Don't be too quick to reject ideas. If sceptical about a possible course of action, focus on how you could make it work. Challenge any internal, external or time constraints you might have in your mind. Try to stretch your thinking. Be curious. Explore possibilities. You may even find an alternative secondary route better than the one that was blocked.

3. Same secondary route - different primary goal – If there appear no feasible secondary goal routes and perhaps the primary goal itself is blocked, then to maintain a sense of goal progress, consider whether your present situation/experience could be used in pursuit of other primary goals. Can you turn the situation to your advantage in some way? Is there something useful you can learn, some hidden potential benefit?

4. Next steps – Make a decision. If there's no perfect solution, choose the route which is most compatible with your core goals. Whatever action you decide to take, note down what exactly you're going to do and when. If straightforward, think how you can integrate the action into your time planning (Activity 2). If more complex, you may need to think through what you need to do more carefully. (See Activity 5 'planning and rehearsing key actions'.)

Activity 5 – Planning and Rehearsing Key Actions

This is about turning your thinking into concrete action. If you constantly think about a problem or issue without deciding or doing anything, it's just rumination which doesn't solve anything. Your thinking should be a prelude to action. Therefore try to restrict thoughts about problems to 'thinking/noting' sessions, i.e. when you can address them properly and make decisions.

If the things you decide to do depend solely on you and you are unlikely to encounter any opposition, then it is just a question of managing your time; in which case Activity 2 should be adequate. If however you are planning something novel, non-routine or difficult, particularly involving other people, then the activity below should help in two ways; firstly by increasing your likelihood of following through with the planned action; and secondly by improving your performance of the action and consequently your chances of success. The better you prepare, the more confident and successful you should be.

Activity 5 – Planning and Rehearsing Key Actions

1. Planning your actions – Think through what when where and how you are going to carry out your plan of action. Visualise yourself doing it. If for example you have to broach a difficult subject, decide where and when exactly would be the right place to do this. Note down your key message and how best to phrase it, particularly your opening words. Break complex tasks down into simple manageable steps. Try to make things easy for yourself.

2. Anticipating others' reactions and your counter-reaction – The more effort you put into considering others' perspectives and goals and expectations and trying to accommodate them, the greater your chances of achieving a mutually satisfactory outcome. So imagine yourself in their position. Consider how they might react to your initiative and how you can best respond. Consider the best and worst case scenarios. What's your bottom line? Will you dig your heels in or graciously accept a negative response to preserve the relationship and fight another day? Level 3 appendix, section 3.3 has some tips on communication skills that you might find useful here.

3. Thinking long term – Consider subsequent stages beyond the forthcoming encounter/action you're planning. Is there something you can do now that will facilitate later stages i.e. reducing potential sources of stress further down the line? Keep the bigger picture in mind. Even if you lose the upcoming battle, you won't necessarily have lost the war. There should still be lots to play for. At the very least you can work on the goal of building your long term resources (e.g. your skills, reputation, useful knowledge of your environment, social connections etc). There is always something you can learn that might be useful for future challenges

4. Accepting uncertainty – Ultimately no matter how good your planning, you can't control what happens. On balance the better prepared you are and the better you respond to others, the better the outcome. But there are no guarantees. So be pragmatic. Accept things might not always work out as planned. Just get out there and give it your best. You'll never know what's possible unless you try.

Note: The things envisaged in this activity don't just have to be difficult prospective encounters. They could be novel enjoyable things, e.g. trying to convince a friend to try a new leisure activity; or planning an act of kindness/surprise for someone. Have some fun with this. Try out new things. Indulge your curiosity. Experiment with life. The more you do this, the more you'll realise how much freedom of choice you actually have.

Final Recap – the Basics

This is the end of the core programme. It may seem a lot to take in initially, but once you've familiarised yourself with the material and applied it a few times, you'll realise it's really straightforward. The programme offers a lot of flexibility, so it's up to you to determine which bits are most useful and how frequently you want to apply them. The more you practise the activities and particularly the more you challenge set ways of thinking and doing things, the more scope you will have for reducing sources of stress in your life and deriving more pleasure. To get you started, the basics are recapped below.

1. You should aim for a minimum of three 20 minute thinking/noting sessions per week. This should ideally be at the end of the day just before you go to sleep, like writing a diary.
2. The logical starting point for most sessions is Activity 1 (i.e. assessing your current situation) which you can combine with whichever activities you think appropriate. The process might seem a bit regimented to start with, but should soon begin to flow naturally as you automatically absorb new ways of thinking about problems.
3. To help develop fresh ideas/insights, you could try adopting different mind-sets for the various activities, as for example illustrated in Table 1b below. Alternatively you could use real people as sources of inspiration e.g. imagining how someone you admire might tackle a particular activity. [See 'Developing creativity' notes in level 3 appendix, section 3.1].

Table 1b Incremental Scale of 'Tactical Intelligence' Activities

No.	Description	Explanation	Mind-set
1	Current signals – red, green or amber	Clarifying starting position – where am I now?	Wise judge, shrewd detective
2	Listing & organising tomorrow's actions	Improving use of time	Agent on a mission
3	Problem rebalancing	Subtle tactical changes to overcome problems	Astute negotiator
4	Finding alternative routes	Major tactical changes to overcome problems	Creative pioneer
5	Planning and rehearsing key actions	Turning thoughts into actions	Meticulous planner, director

4. As the 5 core tactical intelligence thinking/noting activities all relate to your life goals, your starting point and objective for your first session should be to set out your 'goal hierarchy' as illustrated in the 'strategic intelligence' section (i.e. Activity B). You may later review this from time to time.
5. Finally remember: **thinking → noting → doing**. These thinking/noting activities should be viewed as preparation for concrete action. To live differently you need to act differently. And the more you act, the easier it becomes!

Level 3 – Extra help – useful tips & ideas

The instructions provided in Level 2 are all that you need to practise regularly. This section, Level 3, contains additional ideas and techniques that you may find helpful. They constitute skills which can be used as 'internal resources' (See Activity 3 – problem rebalancing). We suggest you dip into this section as and when you need extra help or ideas for the perceptual, strategic and tactical intelligence activities. The resources are grouped under these headings and consist of the items listed below.

1. Perceptual Intelligence

- 1.1. Biases and remedies checklist

2. Strategic Intelligence

- 2.1. Tips on establishing your goal hierarchy
- 2.2. Goal types
- 2.3. Basic planning and organisation

3. Tactical Intelligence

- 3.1. Developing creativity
- 3.2. Importance versus urgency
- 3.3. Communication skills



1. Perceptual Intelligence

1.1 Biases and remedies checklist

There are two categories of perceptual bias that you need to guard against.

A) Evidence/Information Selection Biases

- **Bias: Tunnel vision** – focusing only on limited or certain aspects of a situation and ignoring other evidence e.g. a pessimist might pick out only negative information and an optimist the reverse.
- **Remedy:** Try to weigh up pros and cons to generate a more balanced whole picture view.
- **Bias: Emotional reasoning** – basing your view of situations/yourself/others simply on the way you are feeling, ignoring all other evidence.
- **Remedy:** Try to assess all the facts, not just your feelings. Also where possible, avoid making assessments or key decisions when you're experiencing an extreme mood.

B) Evidence /Information Processing Biases

This category tends to involve hasty, simplistic or exaggerated processing of information e.g.:-

- **Bias: Jumping to conclusions without adequate evidence** e.g.
 - **Mind reading**– assuming you know what another person is thinking
 - **Predictive thinking**– e.g. assuming that things are going to turn out badly
- **Remedy:** Don't assume. Keep an open mind. Learn to hold off judgement until you have gathered more information.
- **Bias: Black and white thinking** – seeing only one extreme or another e.g. viewing significant others and/or their actions as either all good or all bad. (This along with other biases tends to lead to more stressful interpretations of situations).
- **Remedy:** Consider evidence offering a more balanced view, acknowledging possible shades of grey.
- **Bias: Overgeneralization** – taking one instance in the past or present and imposing it on all or current situations (e.g. complaining 'you always.../ never...') or labelling yourself or others (e.g. as being 'incompetent') based on limited evidence and ignoring any facts inconsistent with the label.
- **Remedy:** Be specific in your assessments. Don't rush to generalise or definitively categorise something or someone.



- **Bias: Catastrophising** – blowing things out of proportion. This often involves jumping to conclusions, imagining an escalating chain of negative implications.
- **Remedy:** Just try to focus and deal with the facts of the immediate situation. Speculating about a possible chain of implications is just a waste of time. The further you extrapolate into the future, the less accurate you are likely to be. Furthermore whatever your worst and best case scenarios, outcomes are usually in the middle far from both extremes.
- **Bias: Magnification and minimisation** – e.g. magnifying others' positive attributes and minimising your own. (Again this is likely to lead to more stressful interpretations of situations.)
- **Remedy:** Recognise that everyone has strengths and weaknesses and that though you are well aware of your own weaknesses, other people will naturally be trying to keep their weaknesses hidden from view.
- **Bias: Personalisation** e.g. blaming yourself for things you're not 100% responsible for.
- **Remedy:** Recognise that life is complex and that many people contribute to the events that affect us and others.
- **Bias: Shoulding and musting** – placing unreasonable or excessive demands/expectations on yourself or others
- **Remedy:** Recognise that there are many ways of doing things and that other people may have very different preferences and expectations, which will be products of their own backgrounds and experiences.



2. Strategic Intelligence

2.1 Tips on establishing your goal hierarchy

Table 2 below lists some of the domains you may like to consider when determining your own goal hierarchy. These examples are very general. Your own will be more specific.

Table 2 Life Domains and Goals

Life Domains	Examples of Primary goal
Self-image	Feeling good about oneself e.g. through achievements, skills, principles, helping others, contributing to society, good causes etc.
Health	Reaching or maintaining a desired level of general health / physical ability.
Relationships	Having good relationships with partner, children, other relatives, friends, colleagues etc.
Finances	Being in control of finances, clearing a major debt, saving sum of money for a particular project, security etc.
Work/career	Enjoying and feeling competent and satisfied with work.
Leisure	Becoming proficient in a particular sport, hobby etc.
Broader issues	Supporting / contributing to various causes / issues e.g. social, political, environmental, spiritual etc.
Other	

For each domain and primary goal, you can reduce your vulnerability to stress in the following ways:

1. **Choosing goals over which you have relatively greater control.** This is influenced by:
 - a. **Goal size** – e.g. setting goals that are realistically within your grasp.
 - b. **Goal type** – e.g. involving resources you have greater access to and influence over (see section 2.2 below)
2. **Maintaining flexibility and choice.** This should help you avoid becoming overly dependent on any single issue/factor. It is achieved by:
 - a. **Primary goal flexibility** – i.e. being flexible, not too restrictive in how you define your primary goals.
 - b. **Secondary goal choices** – i.e. being creative in generating as many secondary goal options (i.e. alternative routes to primary goals) as possible.

Illustrations are provided on the next page for 'Positive self-image' (Table 3) and 'Good relationships' (Table 4), two particularly important areas for well-being. (Note: Positive self-image covers a wide range of terms e.g. self-esteem, self-respect, self-worth etc. Generally they all relate to the idea of feeling good about oneself.)



Table 3 Positive self-image

Goal Aspect	Illustration of how to reduce vulnerability to stress
Goal size	The more grounded or realistic the self-image goal, the more attainable. Also the more realistic the goal, the less the likely discrepancy between how we and others see ourselves. Thus for example by not pretending to be something we're not, we should reduce the potential for stress.
Goal type*	Basing your self-worth on internal factors that you can control (e.g. your attitude to life, values, principles, skills, how you treat people etc.) rather than on external factors (e.g. your possessions or job status etc.) which can be threatened or lost.
Primary goal flexibility	Being flexible in how you derive your self-worth e.g. not just tied to a single source such as your work. Otherwise your self-identity or image may be particularly vulnerable to for example losing your job.
Secondary goal choices	If your primary 'self-image or self-worth' related goal is for example supporting good causes, there are numerous ways in which you could do this e.g. donating money, giving away old possessions, volunteering, helping spread the word etc. Thus if one route is no longer feasible, you still have others to choose from.

*See section 2.2 below

Table 4 Good relationships

Goal Aspect	Illustration of how to reduce vulnerability to stress
Goal size	Again this involves choosing a goal that is realistically achievable. For example wanting everyone you meet to like or be impressed by you is not realistic. It will set you up for greater exposure to stress. As relationships are a two-way process, we have to recognise that we can't necessarily develop good friendships/relationships with anyone we choose.
Goal type*	Developing friendships that are intrinsically motivated (i.e. because you enjoy being with someone) rather than extrinsically motivated (i.e. for what you can get out of them). Another useful 'goal type' distinction is focusing on 'processes' rather than 'outcomes'. For example though you can't control the desired 'outcome' of achieving good relationships, you can control the 'process' likely to lead you there e.g. treating others well, being kind, considerate etc.
Primary goal flexibility	Being flexible in your definition of a 'good relationship'. People can relate in different ways and so it helps if you can avoid imposing narrow expectations for how you want the relationship to be.
Secondary goal choices	Of course some ways may be unacceptable and so having alternative routes (e.g. other friendship options) makes us less susceptible to tolerating unacceptable behaviour. Also variety is good. Any one particular friend may not share all our interests. Friends might relocate far away. So it helps to stay open to the possibility of forming new friendships.

*See section 2.2 below

2.2 Goal types

This section gives some pointers on the types of goals that are most conducive to reducing stress and developing long term sustainable well-being.

Abstract versus concrete goals

Setting out your goal hierarchy in terms of primary and secondary goals (Activity B) should help you clarify where you want to focus your time, resources and energy. As life is unpredictable flexibility is important. If you can define your primary goals in abstract terms, this will give you more flexibility with respect to secondary goals. For example in the career domain, rather than stating that you want to end up in 'x' position in company 'y', it will be more helpful to identify the 'intrinsic' qualities you are looking for in an ideal work role, e.g. "I want to feel I have a responsible, important role, in which I can really show my abilities. This might well be satisfied by 'x' position in company 'y', but also by other positions in other companies, if 'x' doesn't turn out to be feasible. For secondary goals however, the more concrete the better as this will help you commit to specific actions e.g. I will send off my application to company X next Wednesday.

Internal versus external goals

These are also referred to as 'intrinsic' versus 'extrinsic' goals. Try to ensure that your list of goals includes things which are internally or intrinsically motivated (i.e. activities that you find inherently enjoyable or meaningful) rather than just extrinsically motivated (i.e. hoping for some external reward or pay-off). Inevitably many of the things we do each day may not be inherently enjoyable and may be done for ulterior motives e.g. earning income to pay bills (i.e. extrinsic goals). However the more you can shift the balance from extrinsic to intrinsic goals, the better this should be for your well-being. For example if you enjoy jogging to improve your health, then that's an appropriate goal to set yourself. If you don't enjoy jogging, you are less likely to persevere in the longer term. You should therefore either try to find ways of making it enjoyable (e.g. trying it as a group social activity) or search for an alternative activity that you do enjoy. Similarly with work, your sense of well-being will be greater if you can find and develop things that you intrinsically enjoy about your job, rather than just seeing it as a means to an end (e.g. salary, promotion to something better). The intrinsic enjoyment can come from doing something well, developing your skills, contributing to something you believe in, doing something that makes you feel a better person etc.

Process versus outcome goals

Another important distinction is between 'outcome goals' e.g. getting a particular job and 'process goals' e.g. focusing on the steps you can take to increase your chances of getting that job. Write down your outcome goal, then work back from that goal, considering all the steps you need to take to get you there. Your focus should then be on your daily process goals. You can't control whether you get the job, but you can control the process. The better you do that, the better your chances.



Unlimited resource versus limited resource goals

Bookshops are crammed with publications, suggesting we can 'have it all', riches, love, fame, success, if we are passionate and truly believe in ourselves and our dreams. Penned by self-made millionaires or Olympic gold medallists, these books suggest that if you copy them, you too can reach their heights. The stark reality is that 99.99 % of readers will not become millionaires with huge mansions or win Olympic gold. It's a simple question of supply and demand.

Your chances of achieving a life dream, depends on the nature of that dream. The more you frame your life goals in terms of scarce resources, the more difficult it will be to reach them and less within your control. This doesn't mean giving up on dreams, just defining them with more care. For example you are more likely to achieve a dream if you frame it in terms of things you can control and where resources aren't limited e.g. becoming a proficient guitarist (note this is also an intrinsic goal) rather than things you can't e.g. becoming a famous guitarist (extrinsic and limited supply). Of course the latter could also happen, particularly the more proficient you become. There is no need to rule out the possibility of such occurrences, no matter how rare. They have to happen to someone. However the key is to make them of secondary importance to your main aim, something you can control.

Fortunately one of the most important resources for human well-being is virtually unlimited in supply – i.e. other people. As we are social animals, our relationships and sense of belonging and connectedness to others is of prime importance. If you recognise developing quality relationships as one of your primary goals, then you have a fair chance of succeeding. We only need a few good friends and with almost 7 billion people on the planet, there's a lot of choice.

Approach versus avoidance goals

Goals can also be classified as either striving for something we want (approach goals) or trying to evade or escape something we don't want (avoidance goals). The range of emotions resulting from doing well or poorly on these two types of goals differs. For approach goals, possible emotions range from 'elation', doing really well to 'depression', doing really poorly. For avoidance goals emotions range from 'relief', doing really well to 'anxiety', doing really poorly. As with many things in life, achieving a balance is important. The strongest positive emotions (i.e. elation) are associated with doing well on key approach goals. Thus your well-being is likely to be enhanced if you can identify approach goals you have a realistic chance of making progress on.

For many of us however, we might know what we don't want. We're just not quite sure what we do want. There seem to be so many choices out there, but also so many potential barriers. If you find yourself in this position, unclear or uncommitted as to which goal(s) to go for, research on well-being suggests that two particularly important goals are (i) developing your personal skills and sense of competence/self-esteem and (ii) devoting time and energy to your personal relationships (i.e. family and friends). These are ultimately far more beneficial than for example chasing status or money.



2.3 Basic planning and organisation

Getting yourself organised can greatly help reduce stress. Some key basic points are listed below:

1. **Start with the end clearly in mind** – Think through very clearly what you want to achieve, by when and the form it will take.
2. **Work backwards to the present** – Working backwards from your end goal, identify key steps and deadlines you will need to meet to accomplish your goal. Planning in this way will clarify what you need to do each month, week etc. It should also help ease uncertainty and anxieties about whether or not you are currently doing enough.
3. **Noting system** – Set up and maintain a simple manageable system for noting and keeping track of key tasks, deadlines etc.
4. **Be realistic** – Don't overload yourself. Focus on the essential things you need to achieve, i.e. minimums rather than maximums.



3. Tactical Intelligence

3.1 Developing creativity

Creativity within the context of this training programme is about generating alternative options for tackling problems. The list below highlights two key facets of developing creativity: (i) overcoming barriers that limit/restrict thinking and (ii) stretching thinking in different directions.

Overcoming barriers

- 1) **Belief** – If you believe there is only one narrow way of viewing a problem and only one solution, you are unlikely to make much progress finding alternatives. To make a genuine effort to find alternative solutions you need to acknowledge that other possibilities exist.
- 2) **Starting questions** – How you define or frame a problem shapes your search for solutions. Your starting question might for example be 'What can I do to change X's mind about Y?' This however assumes the only possible course for action is changing X's mind, which locks you into a particular route (i.e. a particular secondary goal in support of a primary goal). Framing questions in terms of underlying primary goals, opens up a much broader range of possibilities. Thus you should challenge assumptions, boundaries, expectations, conventions etc. that limit the scope of your search for solutions. (NB Using the question 'why' is a useful tool in helping you do this).
- 3) **Suspending judgement** – Don't be too quick to reject ideas. Allow yourself time to run with them, to explore their potential. Despite initial apparent drawbacks, there may be other compensations to weigh in the balance.

Stretching thinking in different directions

- 1) **Systematic searching** – This helps you search for alternative solutions in a comprehensive way that should avoid missing key opportunities. This can be done using checklists or frames of reference. An example used in this programme is addressing 'demands' and 'resources' in terms of 'internal', 'external' and 'time' factors.
- 2) **Using analogies/metaphors** – Often fresh ideas can be generated by considering similar relationships or processes to those involved in your problem, but in different domains, where alternative solutions may be more evident.
- 3) **Novelty generators** – If you find yourself stuck, sometimes turning things on their head, reversing processes, or throwing in random ideas as a catalyst for inspiration, might help get your ideas flowing.
- 4) **Different frames of mind** – The previous three points addressed **where** you might look for potential solutions. It is also possible to vary **how** you look i.e. the frame of mind you adopt. This was illustrated in Table 1b with the different mind-sets suggested for the various 'thinking/noting' activities.

The list above is not exhaustive, but should illustrate that there is plenty of scope for generating alternative ideas and solutions to problems.



3.2 Importance versus urgency

Table 5 Importance versus urgency

	Urgent	Not urgent
Important	1. Necessities	2. Quality projects
Not Important	3. Hot air	4. Trivia

You may find it helpful to locate your daily tasks on the above chart. Work on reducing time spent on category 3 items (e.g. some types of meetings or phone calls may fall into this category). These things might make you feel busy but may not necessarily be very productive. Instead try to devote more time and energy to category 2 items e.g. planning and making preparations for important long term goals. Category 1 items tend to take care of themselves. Category 4 items are not really a concern as you can probably either take them or leave them.

3.3 Communication skills

The better your understanding, communication and co-operation with others, the greater your chances of minimising opposition and securing support in pursuit of your goals. Good communication is also fundamentally important in building strong relationships, which as mentioned in previous sections is a key ingredient for developing well-being and thus an important life goal. If you want to look at 'communication skills' in more detail, there are many books on the subject. Some basic principles are outlined below.

A fundamental principle underlying good communication and building co-operation is our attitude or approach to others. We are more likely to secure co-operation if we approach others with an open mind and respect, seeking to understand rather than automatically criticise or condemn.

Thus one activity that it is useful to plan and practise is to '**assume less, ask more**'. Engage in conversations, with the aim of learning more about someone's viewpoint, rather than aiming to prove them wrong. Be patient. Let others explain themselves. If you and someone else have opposing viewpoints, try to find the source. How have they come to form that opinion? What evidence have they based it on? It might be something you haven't considered. Alternatively they might be misinformed in some way. If you don't fully listen to their reasoning, you won't truly understand the problem.



Once you have listened and understood, another key ingredient in good communication is '**assertiveness**', the balanced middle ground between 'submissiveness' and 'aggression'. It is a vital tool in progressing towards your goals. It is founded on a clear understanding of your rights to make certain requests of others as well as others' rights to decline your requests and vice versa. Thus if from your thinking/noting exercises, you have a clear understanding of what you want to do and what you think is reasonable to ask of others, this should give you clarity and confidence in your actions. Recognise however that others may perceive things differently and have a different view as to what might be fair or reasonable. They also have a right to refuse what you ask of them. Acknowledge this possibility in your planning and consider how best to react if this is the case.

How we respond to others in their own goal pursuits is also important as it sets the tone for the relationships that surround us. The four categories below illustrate four contrasting ways we might respond to the success of someone close to us.

Active/Constructive – clear demonstration of support/happiness

Passive/Constructive – silently supportive

Active/Destructive – openly critical/unsupportive

Passive/Destructive – silently or covertly unsupportive

Unsurprisingly studies have found that 'active/constructive' reactions help build happier, more successful relationships. Note down things you could try in certain situations to be more 'active-constructive'. Try them out and see what happens.

You also communicate not just through what you say, but also what you do. The more generous, kind, considerate you are in your actions toward others, the better, more supportive the environment you create around you. Don't wait for others to make the first move. Plan an act of kindness today.

Finally good communication is also about being present in the moment i.e. here and now. There are opportunities in the present moment that you may never have again. Give your full attention and respect to the person before you. If the present moment or situation is overshadowed by your concerns about another situation, ask yourself if there is anything practical you can do now. If yes, do it. If not, allocate a time when you can and will address it – ideally your next 'thinking/noting' session. Then return your focus to the present.



Appendix C8: Study 1: Activities record form

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3-i Training Study **3-I Activities record form**

Participant Identification Number:

You should aim for **three** 20 minute sessions spread across each week. Please note the day/date, start and end time and the main types of activity for each session. If you choose to do more than three sessions per week, please note the date, times, activities for each additional session. You can start (i.e. 'week 1') on any day convenient.

Week 1	Session 1	Session 2	Session 3	Session 4	Session 5	Session 6	Session 7
Day/Date:							
Start time:							
End time:							
Main activities:							

For 'Main Activities' please indicate which of the following you mainly used for each session (more than one possible):-
A) Challenging perceptions; **B)** Choosing/pursing goals; **1)** Current signals (Red, Green or Amber); **2)** Listing/organizing actions; **3)** Problem rebalancing; **4)** Finding alternative routes; **5)** Planning & rehearsing key actions.

Week 2	Session 1	Session 2	Session 3	Session 4	Session 5	Session 6	Session 7
Day/Date:							
Start time:							
End time:							
Main activities:							

At the end of each week, please email this form to **Steven Dean**: s.dean@bath.ac.uk



Week 3	<u>Session 1</u>	<u>Session 2</u>	<u>Session 3</u>	Session 4	Session 5	Session 6	Session 7
Day/Date:							
Start time:							
End time:							
Main activities:							

Week 4	<u>Session 1</u>	<u>Session 2</u>	<u>Session 3</u>	Session 4	Session 5	Session 6	Session 7
Day/Date:							
Start time:							
End time:							
Main activities:							

At the end of each week, please email this form to **Steven Dean: s.dean@bath.ac.uk**

Notes:

1. If you miss a session or do less than three per week, just record what you have managed to do.
2. If you wish to continue using the activities beyond 4 weeks, you can of course do so, but no further record is required.

Version 140411



Appendix C9: Study 1: Online questionnaire 2 (Time 2)

3-i Training – Online Questionnaire 2



Page 1 of 12

Welcome

Welcome to the 3-i Training skills - Questionnaire 2

Thank you very much for taking part in this study. We hope you have found it interesting. This second online questionnaire addresses your experience of the training programme and any possible effects.

It would help with consistency if you could try to complete this second questionnaire at a roughly similar time of day and in a similar setting to the first questionnaire (e.g. both at home or both at your office).

All answers to the questions in these questionnaires will be kept strictly confidential. It will not be possible to identify your responses from any reports prepared. None of the information will be made available to anyone outside the research team.

There are 10 sections to this questionnaire. It is slightly shorter than the first questionnaire you completed. As before, there are no right or wrong answers. Please simply indicate what seems right for you.

Please note that once you have clicked on the CONTINUE button at the bottom of each page you can not return to review or amend that page

[Continue >](#)

Section 1

1. Please enter the participant ID number you were given.

2. Please enter today's date.

 (DD-MM-YYYY)

3. Please enter roughly what time it is now (e.g 10am, 9.15pm etc)

[Continue >](#)

This was followed by the scales below in the order shown:

PNES – 12; PSS – 10; SES – 12; GSE – 10; GOSS – 6; ISEL – 12; HINT – 12.

Section 10 - Part 1

The training programme identified 3 types of 'intelligence' which can be applied to trying to reduce stress.

Please indicate the extent to which you disagree or agree with the following statements.

69. I found the **perceptual intelligence** activities (e.g. challenging my interpretation of situations, considering alternative viewpoints) useful in helping me deal with problems or sources of stress.

☐ I disagree at lot ☐ I disagree a little ☐ I neither agree nor disagree ☐ I agree a little ☐ I agree a lot

70. I found the **strategic intelligence** activities (e.g. thinking about my main goals or priorities in life and various ways of achieving them) useful in helping me deal with problems or sources of stress.

☐ I disagree at lot ☐ I disagree a little ☐ I neither agree nor disagree ☐ I agree a little ☐ I agree a lot

71. I found the **tactical intelligence** activities (e.g. trying to be more organised and effective in progressing towards goals) useful in helping me deal with problems or sources of stress.

☐ I disagree at lot ☐ I disagree a little ☐ I neither agree nor disagree ☐ I agree a little ☐ I agree a lot

72. If you want to qualify your answers or add any comment about the relative value of the 3 types of intelligence, please add any comments below. (Optional)

Section 10 - Part 2

73. Below is a list of statements of how people might think or feel after trying out the various activities in the training programme. For each sentence, please indicate the extent to which you disagree or agree with each statement.

This relates to your experience of the training programme in general, i.e. an overall assessment.

Try not to let your response to one statement influence your other responses.

	I disagree a lot	I disagree a little	I neither agree nor disagree	I agree a little	I agree a lot
a. I think generally the thinking/noting activities have helped me cope better with stress.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. I didn't like doing the thinking/noting activities at all.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. I applied some of the thinking techniques during the course of my day to day activities.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d. I don't feel I have learnt anything useful to me from participating in this study.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e. I found the process of thinking things through and noting them down quite satisfying.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f. I think the training may influence how I address problems or sources of stress in the future.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
g. I have managed to make progress with some key goals or problems since I have been doing the thinking/noting activities.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
h. I can't see myself continuing to use any of these activities after the study.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
i. I found the thinking/noting activities interesting to do.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

[Continue >](#)

3-i Training – Online Questionnaire 2



Page 12 of 12

End of Survey

Thank you very much for completing this survey.

You will be contacted within the next few days to arrange the final interview to get your views on the training programme. If in the meantime you have any questions, please email Steve Dean (s.dean@bath.ac.uk). Thank you.

Appendix C10: Study 1: Semi-structured interview schedule

1

Semi structured interview schedule

1. Feedback on general presentation of manual / initial reactions to the intervention

- a. Level 1 General principles
 - i. Skills
 - ii. Health benefits
 - iii. Importance of practice
- b. Level 2 Core programme
 - i. Stress model
 - ii. Perceptual intelligence
 - iii. Strategic intelligence
 - iv. Tactical intelligence
- c. Level 3 Extra help – Appendix
 - i. Biases checklist
 - ii. Goal types
 - iii. Creativity
 - iv. Communication skills

2. Feedback on application of concepts and activities and perceived effects. Review by section:

- Stress model
- Perceptual intelligence activities
- Strategic intelligence activities
- Tactical intelligence activities
 - Current signals – red
 - Current signals – amber
 - Current signals – green
 - Listing and organising tomorrow's actions
 - Problem rebalancing
 - Finding alternative routes
 - Planning and rehearsing key actions
- Appendix activities
 - Biases checklist
 - Goal types
 - Creativity
 - Communication skills



Key questions per section:

- General reaction – how did you find the activities?
- What activities did you do and why?
- What did you like? What didn't you like? Reasons?
- What sort of things/problems/issues did you apply it to?
- Outcomes? What did it help with? What didn't it help with? Examples of success & failure?
- How did this compare to your expectations?
- Have you tried anything like these activities in coping with stress before?
- Would you consider continuing to use the activities?

3. Recommendations for future improvements

- Facilitators/impediments to effectiveness/sustainability
 - **Person related** – What type of people do you think would respond well / poorly to this approach? (e.g. patient, CFC?)
 - **Context related** – What types of situations do you think this is good for / not good for?
- Possible design changes.
 - Things to change / emphasise / clarify?
 - Things to drop?
 - Things to add?
- Participant issues, questions.



Appendix C11: Study 1: COPE subscales and Cronbach's α scores

Subscale	Items	Carver (1997)	Study 1
Acceptance	20, 24	.57	.56
Active coping	02, 07	.68	.87
Behavioural disengagement	06, 16	.65	.73
Denial	03, 08	.54	.61
Distraction	01, 19	.71	.30
Emotional support	05, 15	.71	.80
Humour	18, 28	.73	.69
Instrumental support	10, 23	.64	.61
Planning	14, 25	.73	.58
Positive reinterpretation	12, 17	.64	.68
Religion	22, 27	.82	.93
Self-blame	13, 26	.69	.51
Substance use	04, 11	.90	.95
Venting emotions	09, 21	.50	.87

Appendix C12: Study 1: TIPI items and Cronbach's α scores

Personality trait	Items	Gosling et al. (2003)	Study 1
Agreeableness	2R, 7	.40	.53
Conscientiousness	3, 8R	.50	.48
Emotional stability	4R, 9	.73	.88
Extraversion	1, 6R	.68	.71
Openness to experience	5, 10R	.45	.17

Appendix D1: Study 2: Participate in projects advert

Participate in projects

Study: New techniques to reduce stress / improve well-being

We are conducting a study to test the effects of a new training programme designed to reduce stress and improve well-being. As people with busy working lives have little time for lengthy solutions, we are investigating whether a self-administered training programme involving just 5 to 10 minutes practice per day can produce enduring benefits. Participants do not need to report anywhere or meet with researchers. The training and practice are provided online and can be accessed whenever and wherever convenient for participants.

This study is part of a doctoral research programme supervised by Dr Julie Turner-Cobb.

Who can take part?

We are seeking to recruit 50 participants (men and women) who are full-time administrative staff at the University of Bath (grades 3 to 7). The study is also open to part-time administrative staff able to practise the techniques five days per week.

What is involved and how long will it take?

The study essentially involves practising a series of brief online thinking and noting techniques over a period of four weeks. The techniques take 5 to 10 minutes in total to complete each day. After four weeks there is a further optional two weeks, making a total of six weeks for the whole study. The effects on participants' stress levels and well-being are assessed in a series of online questionnaires.

Is it confidential?

Yes. Your participation and any information you provide will be kept strictly confidential. Online data collected will be anonymised and identified by code number only. The study has received full ethical approval from the University of Bath Psychology Ethics Committee (Ref: 12-048).

How to take part?

For more detailed information about the study please see the [Participant Information Sheet](#)

To participate in the study, please complete and return the [Consent form](#)

Want to know more or have further questions, please contact Steve Dean: S.Dean@bath.ac.uk

Appendix D2: Study 2: Participant information sheet



Participant Information Sheet

Project title: "Daily focus – 3-i skills training"

You are being invited to participate in a research study. Before you decide whether you would like to take part, it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully. Ask us if there is anything that is not clear or if you would like more information.

❖ *What is the purpose of the study?*

The purpose of this study is to test the effectiveness of a set of thinking skills designed to overcome stress and enhance physical and psychological well-being. As people with busy working lives have little time for lengthy solutions, we are investigating whether a self-administered online training programme involving just 5 to 10 minutes practice per day can produce enduring benefits. The focus is on reducing stress at work, but can be applied more broadly.

❖ *Who can take part?*

We are seeking to recruit 50 participants, men and women aged 18 to 65 with busy working lives who would like to gain more time and control over various sources of stress. To ensure we are testing the programme in similar working environments, we are aiming to recruit full-time administrative staff at the University of Bath in grades 3 to 7.

❖ *What does the study involve?*

The study essentially involves practising a series of thinking techniques over the course of a month. Participants complete questionnaires before and after the training to assess any changes in well-being. There are also two short interim questionnaires to monitor progress. Participants do not need to report anywhere. The training, practice and questionnaires are all online and can be accessed whenever convenient for participants. The process is described in more detail below:

Step 1 – Baseline questionnaire

Participants complete a preliminary online questionnaire addressing the well-being measures the techniques are designed to improve. This provides a baseline against which to measure any subsequent changes. The questionnaire also addresses thinking styles or preferences which may influence use of the techniques. It should take around 30 to 40 minutes to complete.

Step 2 – Starting activity

Participants complete the first thinking activity. This is done once at the start of the programme. It involves considering four strategic ways of combating stress and noting any conclusions. This should help clarify participants' priorities for the training programme.

Step 3 – Daily activities

Participants then begin the 'daily focus' programme. There are two activities. The first helps you interpret and learn from your previous day's experiences, whether good, bad or indifferent. The second helps you make better use of the day ahead, through developing your creativity and resourcefulness. There are six prompts designed to stretch your thinking in different directions. You simply note actions you think might be helpful under any relevant heading. You are free to decide how much time you spend on any of the activities. The only requirement is that you log on at least 5 days a week (i.e. usually work days) and spend a minimum of 5 minutes considering your options for the day ahead. To allow time to master the techniques and for any benefits to emerge, participants are requested to practise the techniques for a minimum of 4 weeks. Beyond that there is a further optional 2 weeks for anyone who would like to keep the practice going.



Step 4 – Progress and outcome assessment

To assess the rate of progress and any overall benefits, there are short on-line progress check questionnaires at the end of the first and third weeks. They are identical and should take 10 to 15 minutes. Finally 6 weeks after starting there is a final questionnaire to assess the overall effects. This timing will be the same (i.e. at the end of week 6) whether participants do just the basic 4 weeks, or the 4 plus 2 optional weeks. The questionnaire should take 30 to 40 minutes.

Note: The main researcher, Steven Dean, will provide guidance and links to the various online components throughout the programme. He will also respond via email to any questions that may arise. Also if participants agree, he will send a follow up email at 6 and 12 months to see how many have continued with the techniques.

❖ Are there any risks or disadvantages of taking part in the study?

There are no identified risks or disadvantages of taking part in this study. The thinking skills are derived from psychological research published in reputable academic journals. The skills are intended to improve participants' well-being by enhancing their capacity to deal successfully with stressful situations and achieve better progress towards desired outcomes. Thinking about sources of stress and how to overcome problems may not appeal to everyone however and so the techniques may not suit all individuals. But as the training is self-administered, participants need only address issues they feel comfortable with. If issues arise however that they would like help with, a contact number for a free counselling service is provided below.

❖ Will my taking part in this study be kept confidential?

Any information you provide will be kept strictly confidential. Participant information provided in the questionnaires and written comments in activities will be anonymised i.e. identified by code number only. Any contact details that you choose to give us for communicating about the research will be stored separately from the data collected. This information will be kept in locked cabinets at the University of Bath. No one, other than the two Bath University researchers involved in the project, will see or have access to your details. To further enhance the anonymity of the data, it is suggested that participants use made up names or initials to refer to people or issues in what they write online. Participants' notes only need make sense to them. The research interest is not in individual details, but in the overall frequency and amount of use of the different techniques and how this relates to outcomes. It can sometimes be helpful to use anonymised quotes in reports, publications, verbal presentations or teaching materials to illustrate particular themes or issues. In this study however participants' written comments will only be considered for use in this way if participants expressly agree. Participants will be given this clear choice at the end of the study in the final questionnaire.

❖ What will happen to the results of the research?

Once the study has been completed, if you wish you can receive a summary of the main results via email. The findings may also be presented at conferences and be published in an academic journal. Some of this research will also be written up for a PhD thesis within the University of Bath. You will not be identified in any reports or publications of the research.

❖ Who is organising the research?

The project is funded by the University of Bath and is being carried out by Dr Julie Turner-Cobb (Principal Investigator) and Mr Steven Dean (PhD research student), both at the University of Bath. This study has been approved by the Research Ethics Committee in the Department of Psychology, at the University of Bath and adheres to British Psychological Society (BPS) guidelines for ethical practice in psychological research.

❖ Contact for further information or assistance

For further information or assistance concerning the study please contact Steven Dean by email: s.dean@bath.ac.uk.

Should you be concerned about any health or well-being issues raised during the course of the study then please contact your GP. Employees of the University of Bath can also access a free counselling service provided by the Royal United Hospital, Bath. The contact telephone numbers are (01225) 825960 or (01225) 824484.

Thank you for reading this information



Appendix D3: Study 2: Participant consent form



Study Number:

Participant Identification Number:

CONSENT FORM

Project title: "Daily focus – 3-i skills training"

Name of researchers:

Dr Julie Turner-Cobb (Principal Investigator), University of Bath
Mr Steven Dean (PhD Research Student), University of Bath

Please
place tick
in box

1. I confirm I have read and understand the Participant Information Sheet (version 200312) for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily. ☐ YES
2. I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason. ☐ YES
3. I agree to take part in the above study. ☐ YES

Name of Participant

Date

Name of Researcher

Date


To confirm your consent, please tick the three 'yes' boxes, type in your name and the date and email to: s.dean@bath.ac.uk

Please also retain a copy for yourself. Thank you.

Version 200312

Appendix D4: Study 2: Introductory questionnaire – Parts 1 & 2 (Time 1)

Introductory Questionnaire Part 1

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Welcome to the Daily Focus 3-i skills training programme

Thank you for volunteering to take part in this study. We hope you find it interesting.

To make it easier for participants, this introductory questionnaire has been divided into 2 parts. You can do both parts in one go, or take a break between the two if you prefer.

There are **9 sections** to this first part. It should take about **20 minutes** to complete.

As the training helps combat stress in numerous ways, we are using a range of scales to identify and measure various routes for improvement as well as factors influencing success. Your efforts therefore will be greatly appreciated. Lessons learnt will be reported back to you at the end of the study.

All answers will be kept **strictly confidential**.

Please note that once you have clicked on the CONTINUE button at the bottom of each page you can not return to review or amend that page

Continue >

3-i Training skills - Questionnaire 1

The questions in this survey address a wide range of factors which can be associated with **stress**. We would be grateful therefore if you could answer **all** questions.

However many questions have a 'n/a' (not applicable) option if none of the answers are appropriate, or if you prefer not to answer for any reason. Similarly you can write 'n/a' in any of the comments boxes if you prefer not to answer.

Please remember that once you have clicked on the CONTINUE button at the bottom of each page you can not return to review or amend that page

Section 1 - General demographic and work related questions

1. Please enter the participant ID number you were given.

More Info

2. Please enter roughly what time it is now (e.g 10am, 9.15pm etc)

3. What is your gender?

☐ Female ☐ Male

4. Please type in the **year** you were born.

5. How would you describe your ethnic origin? Please tick one.

- ☐ White British
- ☐ Any other white background
- ☐ Asian British
- ☐ Any other Asian background
- ☐ Black British
- ☐ Any other Black background
- ☐ Mixed British
- ☐ Any other mixed background
- ☐ Chinese British
- ☐ Any other Chinese background
- ☐ N/a
- ☐ Other (please specify):

6. What is your current marital status or same-sex civil partnership status? Please tick one.

- ☐ Currently married and living together, or living with someone in a registered same-sex civil partnership
- ☐ Single
- ☐ Separated / divorced / formerly in a registered same-sex civil partnership
- ☐ Widowed / surviving partner from a same-sex civil partnership
- ☐ N/a
- ☐ Other (please specify):

7. Do you live in a:

- ☐ House.....
- ☐ Flat.....
- ☐ Bedsit.....
- ☐ Hostel or Hall of Residence.....
- ☐ N/a
- ☐ Other (please specify):

8. How many people live in your home (including you)?

9. How many children do you have?

Select an answer -

10. How many children under the age of 18 live in your home?

Select an answer -

11. How many children of 18 or over live in your home?

Select an answer -

12. What is the age of the youngest child living in your home, if any? (Please insert 'n/a' if none)

13. What is your highest level of educational qualification? Please tick one.

- ☐ None
- ☐ CSE's or equivalent
- ☐ GCSE's, O levels or equivalent
- ☐ A/AS levels or equivalent
- ☐ Degree (BA, BSc or equivalent)
- ☐ Postgraduate degree (MA, MSc, MPhil, PhD)
- ☐ n/a
- ☐ Other (please specify):

14. How many hours a week do you usually work at your place of work?

15. How many hours a week on average do you work at home? (Note: This refers to 'paid employment', not for example housework.)

16. What type of department or function do you work in?

Select an answer -

If you selected Other, please specify:

17. How much flexibility / choice do you have in the timing, order or way in which you carry out your work tasks?

- ☐ I have a large amount of flexibility/choice.
- ☐ I have a moderate amount of flexibility/choice.
- ☐ I have a slight amount of flexibility/choice.
- ☐ I have no flexibility/choice.
- ☐ Other (please specify):

18. On what basis are you currently employed?

- ☐ Temporary staff
- ☐ Permanent staff
- ☐ Other (please specify):

19. If you work at the University of Bath, what is your job grade? (Please select 'n/a' if not a University of Bath employee.)

Select an answer -

20. Approximately how long have you been working in your present job role or function? (i.e. how long since the last major change in the location, nature, content or organisation of your work?)

21. Approximately how long is it since there was a major change in your routine / pattern of living outside work (e.g. change of where you live or who you live with, etc.)?

22. At work, how approachable / open minded / open to discussion of your ideas and suggestions, do you consider your line manager / supervisor?

- ☐ Very approachable / open to discussion
- ☐ Moderately approachable / open to discussion
- ☐ Not particularly approachable / open to discussion
- ☐ Difficult to approach / discuss things with
- ☐ N/a
- ☐ Other (please specify):

Continue >

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Section 2 - Health and lifestyle related questions

23. How is your health in general? (NB This refers to both physical and/or psychological well-being).

- ☐ very good
- ☐ good
- ☐ fair
- ☐ bad
- ☐ very bad
- ☐ n/a

24. Do you smoke cigarettes regularly (i.e. on a daily basis)?

- ☐ yes, current smoker
- ☐ no, ex regular smoker
- ☐ no, never or hardly ever smoked
- ☐ Other (please specify):

25. If you are a current smoker, on average how many cigarettes do you smoke on a week day?

If you don't smoke, please enter *none*

26. On average how many days a week do you take some form of exercise?

Select an answer ▾

27. What type of exercise is this **AND how long do you usually do it for on each occasion? (If none, please type n/a)**

28. What is your height? (either in metres or in feet and inches)

29. What is your approximate weight? (either in kilos or stones/pounds)

30. Have you had any kind of stress management training before?

- ☐ No I haven't had any stress management training.
- ☐ I'm not sure.
- ☐ Yes, I have had stress management training.
- ☐ Other (please specify):

31. If you have had some form of stress management training, please briefly state what kind of training. (If none, please type n/a)

32. Are you able to access the internet from home?

- ☐ Yes
- ☐ No
- ☐ Other (please specify):

33. Do you or have you ever kept a regular diary (i.e. of events that have happened each day)?

- ☐ No, never
- ☐ Yes, but a long time ago
- ☐ Yes, relatively recently
- ☐ Yes, currently
- ☐ Other (please specify):

This was followed by the scales below in the order shown:

PNES – 12; PSS – 10; HADS – 14; GOSS – 6; HINT – 12; W-BNS – 18; GSE – 10.

End of Part 1

Thank you for completing Part 1.

The link to Part 2 is:

<https://www.survey.bath.ac.uk/q1part2/>

IF TAKING A BREAK BEFORE COMPLETING PART 2, **PLEASE COPY AND SAVE THIS LINK.**

Introductory Questionnaire Part 2**Welcome Back**

Thank you for completing Part 1.

There are **9 sections** to Part 2. It should take about 20 minutes to complete.

As previously stated, all answers will be kept **strictly confidential**.

Please note that once you have clicked on the CONTINUE button at the bottom of each page you can not return to review or amend that page

Continue >

Login

1. Please enter the participant ID number you were given.

More Info

2. Please enter today's date.

 (DD-MM-YYYY)

3. Please enter roughly what time it is now (e.g 10am, 9.15pm etc)

Continue >

This was followed by the scales below in the order shown:

TIPI – 10; LOT-R – 10; REI – 10; CFC – 12; ISEL – 12.

Section 9

Finally, your current thinking and approach to stress management, before starting the training programme.

24. What do you currently do, if anything, to cope with or reduce your stress?

25. Have you given much thought as to how you might better cope with or reduce your exposure to stress in the future? If yes, what kind of things did you have in mind?

Continue >

End of Introductory Questionnaire

Thank you completing the introductory questionnaire.

The link to the **Training Guidance Notes** is:


<https://www.survey.bath.ac.uk/guidance-notes/>

PLEASE COPY AND SAVE THIS LINK.

YOU MAY WANT TO REFER TO THE NOTES ON MORE THAN ONE OCCASION.

Appendix D5: Study 2: Training guidance notes

Training Guidance Notes

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BATH

Page 1 of 11

Welcome to the Daily Focus 3-i skills training programme

There are 8 sections as shown below. Most are quite short. Please take your time and read these notes carefully. It should only take about 20 to 25 minutes.

- Section 1 - Login
- Section 2 - Stress, its impact and the solution
- Section 3 - Balancing your impulsive, rational and habitual self
- Section 4 - Strategic intelligence
- Section 5 - Perceptual intelligence
- Section 6 - Tactical intelligence
- Section 7 - Key questions about the training programme
- Section 8 - Confirmation of participation

As you go through these notes, you may find it helpful to copy and paste sections into a Word file for later reference.

Alternatively you can log in again at a later date to review the sections that interest you. You won't need to complete section 8 again. You can simply close the browser window before you get to that section again.

Continue >

Page 2 of 11

Section 1 - Login

1. Please enter the participant ID number you were given

More Info

2. Please enter today's date. (Just click on 'Today' at the bottom of the calendar box. The box appears when you click in the answer space below).

(DD-MM-YYYY)

3. Please enter the time now to the nearest minute (e.g 9.06 am, 4.38 pm etc)

Continue >

Page 3 of 11

Depending on your security settings, you may get a pop-up on the next page asking:

"Do you want to view only the webpage content that was delivered securely?"

To see the 'STRESS IMBALANCE FIGURE' referred to in the text, click - **'NO'**.

Continue >

Section 2 - Stress, its impact and the solution

What is stress?

As illustrated in the figure below, stress can be viewed as an imbalance (real or imagined) between demands and resources in pursuit of a particular goal or goals. Thus we feel stressed when the demands placed upon us (e.g. workload, duties, personal commitments to family and friends etc.) appear to exceed the resources available to us (e.g. time, money, energy, knowledge, skills, help from others etc.) to meet those demands.

What is the impact of stress?

When we feel overstretched, unable to meet the various goals we or others have set for ourselves, this affects us both psychologically and physically. When we are making progress towards goals we experience positive emotions. However when our progress towards goals appears blocked or threatened, this generates negative thoughts and emotions (e.g. frustration, anxiety, worry, panic, anger). These negative emotions in turn trigger the release of stress hormones which mobilise the body to take corrective action to overcome perceived problems or threats.

In short bursts these reactions are not necessarily problematic and may even be beneficial. However if the stress persists over months and years, repeated triggering of stress hormones can contribute to a wide range of physical health problems as well as poor mental health.

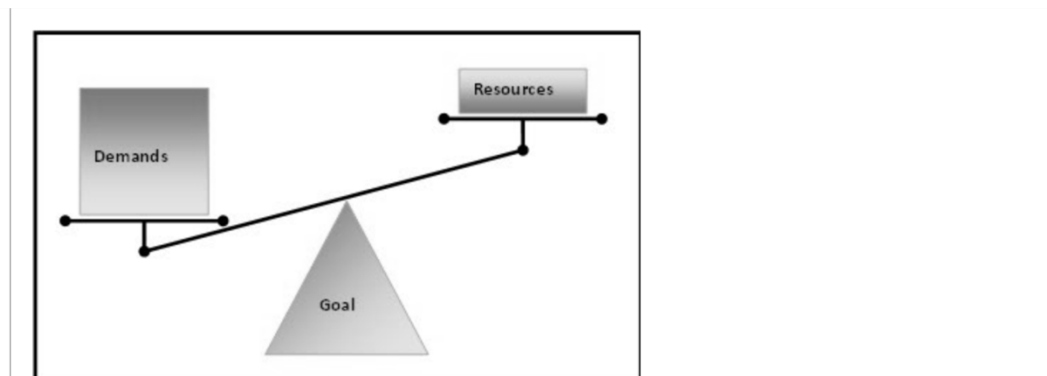
So what is the solution to stress?

As stress stems from a perceived imbalance of demands versus resources in pursuit of a particular goal or goals, there are 3 possible ways to reduce that stress:-

1. Revise our goals
2. Reconsider our perceptions
3. Reduce the demands and/or increase our resources

These 3 ways of reducing stress correspond to 3 types of 'intelligence' skills (**1. Strategic, 2. Perceptual, 3. Tactical**). The first is about setting long term priorities and is addressed in a single session at the start of the training. The second and third are about day to day decision making and are addressed in the Daily Focus sessions.

Before outlining the skills, the next section explains the roles of different parts of your brain in learning to apply such skills.



Continue >

Section 3 - Balancing your impulsive, rational and habitual self

To be able to use the skills it is important to understand the distinction between three aspects of brain functioning, characterised as **'the impulsive self'**, **'the rational self'** and **'the habitual self'**. Though interlinked, they are rooted in different parts of the brain which have evolved at different times to serve different functions.

1. The Impulsive Self - PRIMITIVE / ('CHILD')

This is an older part of the brain (the limbic system) adapted for primitive environments, in which our survival was constantly under threat. Quick responses were essential. Our impulsive self therefore makes snap decisions, black and white judgements based on gut feelings and impressions. It is guided by the here and now, craving simple certainties and immediate results. No thinking effort is involved. It is instant and automatic, driven by fear and other basic drives.

2. The Rational Self - ADVANCED / ('ADULT')

This more recent part of our brain (principally the prefrontal cortex) has evolved to deal with the complexities of life in modern human societies, where threats tend not to be so immediate and getting what you want requires more than just strength or speed. Our rational self (*also called 'reflective self'*) therefore is calm and deliberative. It gathers evidence and applies logic and reasoning (common sense), weighing up options to decide optimal courses of action. It also accepts uncertainty, recognising there are no guarantees. This requires effort and often involves delaying present gratification to achieve longer term gains.

3. The Habitual Self - AUTOMATED / ('ROBOT')

When we are not reacting to life threatening circumstances (impulsive self) or learning to deal with novel situations or problems (rational self), much of our behaviour is routine. This is governed by the 'habitual self' (involving brain structures such as the basal ganglia and cerebellum) and requires no thought or effort. We just run on auto-pilot, repeating previously learnt behaviours.

Illustration of the three in action

A simple example is learning to drive. When first learning to change gears, a person's impulsive self might gasp 'This is impossible. I'll never get the hang of this.' Their rational self however might think 'OK, it's difficult, but I've managed difficult things in the past. If I persevere, I'm sure I'll get it eventually.' With practice, a month or two later the person's habitual self would have taken over, and they'd be changing gears without thinking.

The three in action applied to stress

Our impulsive self and rational self are often in conflict, vying for control over our behaviour. The impulsive self doesn't question whether its reaction is appropriate. Only the rational self can judge this. In the driving example cited, the rational self asserted control and the person achieved their goal of learning to drive.

When we feel threatened or stressed however, the impulsive self is more strongly primed and it takes more effort for the rational self to seize control. If too tired to make this effort, we sometimes give in to our impulsive self and follow its simple black and white dictates: **fight** (get angry, blame someone else) or **flight** (ignore or run away from the problem e.g. letting unpaid bills pile up on the mat). If you're tired or stressed when reading this, your impulsive self might be telling you things like 'I haven't got time for this. I don't want to have to make an effort. It's not for me.' This type of message might also have become automated as part of your habitual self.

How this training helps

As your rational self is best placed to resolve most of the things that cause you stress, this training aims to help you to strengthen this part of your thinking in three ways:

- (i) Prompting you to make the effort to invest in your rational self in short manageable bursts e.g. 10, 20, 30 minutes.
- (ii) Equipping your rational self with useful tools so that it's more effective and likely to produce clear benefits.
- (iii) Providing a framework for habitual practice so that it eventually becomes automatic and effortless like changing gear.

Continue >

Section 4 - Strategic Intelligence (SI)

Setting your stress reduction priorities at the start

The Strategic Intelligence (SI) session is just a **one-off**. So with your 'rational self' in gear, your aim for the session should be to think of **one or two ideas to help reduce your long term exposure to stress**. The activities focus on **work stress**, but can be applied to other sources of stress (e.g. home life, relationships etc.).

As mentioned in the first section, progress towards goals triggers positive emotions. Inadequate or blocked progress towards goals triggers negative emotions including stress. Thus to reduce stress, you need to focus on goals where you have a realistic chance of making progress; i.e. where you have the necessary resources (e.g. knowledge, skills, money, support etc.) and/or are unlikely to face many barriers or difficulties. Only your rational self can judge what's realistic. Key points that stem from this are:

1. Your choice of goals largely determines the amount of stress you encounter. Thus control of your stress ultimately resides with you.
2. The fewer goals you chase, the less your exposure to stress. So just concentrating on priorities is key.
3. Focus on goals you have a realistic chance of achieving. This means setting realistic limits on what you expect of yourself and on what others can expect from you.
4. Challenge things you do out of habit or impulse. Are they producing the results you want?
5. Work on developing your own personal resources as well as gaining better access to helpful resources around you.

There are 4 activities in the SI session. These are outlined below. Each highlights a different possible strategic / long term route for reducing stress:

Activity 1: Reducing **external sources** of stress in your environment - *e.g. being better able to avoid / resist taking on too much.*

Activity 2: Reducing **internal sources** of stress - *e.g. challenging your own possibly excessive, unrealistic or unnecessary expectations.*

Activity 3: Increasing **internal sources** of competence / control over situations - *e.g. developing personal or work related skills.*

Activity 4: Increasing **external sources** of support - *e.g. improving co-operation with colleagues and others you might rely on for help.*

The best of the ideas you generate can later be applied in your Daily Focus sessions.

Continue >

Section 5 - Perceptual Intelligence (PI)

Improving your understanding of daily events and the emotions they trigger - (Part of Daily Focus session)

Stress responses are triggered by your perceptions of events, situations, people etc. The first part of your brain to react is the impulsive self. However its instant impressions may not be accurate representations of the underlying reality. 'Perceptual intelligence' relies on your rational self taking a closer look, assessing the accuracy and reliability of those first impressions. Developing your 'perceptual intelligence' can help lower stress and enhance progress towards your goals in two ways:

- (i) - It can help reduce the triggering of stressful 'false alarms' or over-reactions caused by hastily jumping to wrong conclusions.
- (ii) - It can help you devise more appropriate effective solutions to problems, by basing them on more considered assessments of the challenges faced and the options available.

Perceptual intelligence starts with understanding emotions (in yourself and others). Our emotions are important and useful signalling devices. Positive emotions suggest we're on the right track. Negative suggest something might be blocking or threatening our progress. Neutral suggest we're not really going anywhere. Emotions can be misleading however, particularly when triggered by the impulsive self. So before responding to emotions it's important to check their source, identify the cause, see what we can learn and use this to better guide our future actions. Key points to note are:

1. Perceptual intelligence is not about 'positive thinking'. It's about '**balanced thinking**', weighing up all the evidence.
2. It's also about '**flexible thinking**', recognising that there's more than one possible interpretation of any situation.
3. The more complex a situation, the more people involved, the greater the potential for wrong assumptions.
4. It is important therefore to recognise that your impulsive self might be misleading you, jumping to the wrong conclusions, automatically assuming the worst.
5. The key is to give your rational self time to think, to get things in perspective, make a proper assessment and respond accordingly.

There are three PI activities. They are part of the Daily Focus session. The usual practice is to focus on one each day i.e. whichever emotion is most prevalent:

Activity 1: Negative emotion - *e.g. signal that a goal appears blocked or threatened.*

Activity 2: Positive emotion - *e.g. signal that progress appears satisfactory.*

Activity 3: Neutral/flat emotion - *e.g. signal that there's no apparent goal threat, but no goal progress either.*

The aim is to develop **flexibility** in how you interpret and respond to situations. This should give you **more options** for action and **more scope for control**.

Continue >

Section 6 - Tactical Intelligence (TI)

Developing your resourcefulness - (Part of Daily Focus session)

'Tactical intelligence' also comes under the domain of the rational self. It refers to the organisation, flexibility and ingenuity with which you set about achieving the goals you have decided to pursue. This involves clear thinking, effective planning, adaptability, creativity, resourcefulness and resilience in overcoming obstacles. The more you develop such skills, the less threatened you should feel whenever facing potential problems. Key points to note are:

1. The more thought you put into any plan, the more effective it is likely to be.
2. In planning out your day, focus on what's distinctive, different, not routine. The routine will happen anyway.
3. Plan what you know you can do. Small manageable steps are infinitely better than large unrealistic ones.
4. Focus on what you can control (e.g. your choices and behaviour). Accept what you can't control (e.g. other's choices and behaviour). There's plenty of scope for action in the former.
5. Planning with action equals progress. Planning without action equals day-dreaming. So **plan to take action**.

The six TI activities are part of the Daily Focus session. They help your rational self prioritise and clarify what you need to do each day. They help you think around problems or break them down into smaller more manageable parts. They also encourage better timing and balance of activities across the day. The end result is that you should eventually experience smoother less stressful days, where you feel more in control and able to make progress on what's important to you. The issues addressed are as follows:

Activity 1: Deciding what to do and what not to do.

Activity 2: How to manage your energy and motivation for a smooth flow across the day.

Activity 3: How to make your tasks easier through reducing demands or increasing resources.

Activity 4: How to think creatively around problems.

Activity 5: How to get more of the things you want out of your day.

Activity 6: How to shape your environment to help you.

These TI activities are effectively a box of **problem solving tools**. The idea is that you open up the toolbox each day and select the tool(s) that best suit any problem or challenge you might be facing. Although you might not use them all regularly, it's useful to know what each can do. So aim to give them all a try at some stage.

Continue >

Section 7 - Key questions about the training programme

What basically do I need to do?

• **Strategic Intelligence session - 30 minutes**

Your aim should be to think of long term ways in which you can reduce the demands on yourself and / or increase the resources and support available to you. You can then begin to work on these in your Daily Focus sessions.

• **Daily Focus sessions -- (Perceptual and Tactical intelligence activities) - 5 - 10 minutes**

This simply involves taking a few minutes each day to allow your rational self to figure out the most sensible thing for you to do, and to translate this into a clear plan of action.

How can a daily plan reduce my stress?

It increases your control over what happens to you. Stress arises when things don't go your way. The more constructive thought you put into what you want from each day and how best to achieve it, the more likely it is to happen.

Why is writing each day important?

If you just think about things in your head, you tend to go round in circles (e.g. fretting, ruminating about possible threats). This is typically a combination of 'impulsive' and 'habitual' modes of thinking which continually triggers stress hormones, but doesn't bring you any closer to a solution. Writing things down however facilitates more constructive 'rational thinking'. It helps you see things more clearly. It enables you to capture and develop ideas, think through options and arrive at clear decisions as to what you can do to improve things.

How often should I do this?

The ultimate aim of this training is to help make your strategic, perceptual and tactical thinking automatic and effortless i.e. part of your 'habitual self'. The best way to develop a habit is to do it everyday. As the focus is on alleviating work stress we suggest you aim for 5 days a week, 5 to 10 minutes each day. If you would like to try 7 days a week that's also possible. Home life / leisure time can also benefit from these activities. Thus if the study overlaps with any holiday periods, the 5 to 10 minute Daily Focus sessions should still be feasible and beneficial. If holidays are an issue, please feel free to discuss this with Steven Dean (s.dean@bath.ac.uk).

If I'm really busy or stressed, how will I find time for this or keep it going?

The basic commitment after the preliminary activities, is simply to log into the Daily Focus site each day. Once logged in, if you only have a minute or two to think, every little helps. Moreover it's when you're stressed and struggling to cope, that you most need to stop and consider whether you're responding to the pressures in the most appropriate way. If your habitual and impulsive self are running the show, you're likely to be missing out on far better ways of dealing with your problems.

What benefits can I expect from this?

Everyone is different and will take different things from these activities. Whatever your starting point, the idea is to 'stretch yourself' beyond where you are now. If you never usually plan, just making a simple plan will be a step forward. If you already plan each day, you can use the Daily Focus activities to make your planning more effective.

The ultimate potential benefit of the training is not that you end up with a life that is problem free. That doesn't exist. The ultimate prize is learning to feel more relaxed and confident in the face of problems, knowing you have the skills to make the best of whatever comes your way.

Continue >

Section 8 - Confirmation of participation

From the guidance notes you should now have a **clearer idea** of what the training involves.

Earlier piloting of this training has shown that **most participants complete** the basic four weeks of Daily Focus sessions with little difficulty.

We recognise however that this training **may not appeal to everyone**. Consequently if you feel it is not for you, or perhaps this isn't the right time, please feel **free to withdraw** now.

Deciding to withdraw is not a problem. With just limited places available, it will help if they are taken by participants who are **currently motivated to work on ways of reducing stress**.

Questions 4, 5, 6 and 7 should help you decide

4. Do you think you are stressed?

- ☐ I don't think I am stressed.
- ☐ I am unsure if I am stressed.
- ☐ I think I am stressed
- ☐ Other (please specify):

5. Do you want to take action now to address your stress?

- ☐ I have decided I don't want to take action now.
- ☐ I am unsure whether or not I want to take action now.
- ☐ I have decided I want to take action now.
- ☐ Other (please specify):

6. From what you have read about the present training programme, do you think it might be able to help you?

- ☐ I don't think this training can help me.
- ☐ I am unsure whether training can help me.
- ☐ I think this training can perhaps help me.
- ☐ I think this training can definitely help me.
- ☐ Other (please specify):

7. Have you had any previous training similar to the programme described here?

- ☐ No I haven't had any training similar to this.
- ☐ I am not sure if I have had training similar to this.
- ☐ Yes I have had training similar to this.
- ☐ Other (please specify):

Your decision

8. Would you like to proceed with the training programme?

- ☐ Yes, I confirm I would like to proceed with the training. (Note: If yes, please answer questions 9, 10, 11, 12 only.)
- ☐ No, I have decided to withdraw. (Note: If no, please answer questions 13, 14 and 15 only.)

If you wish to proceed, please answer Questions 9, 10, 11 and 12, then continue to the last page.

(Please ignore 13, 14 and 15 which are for withdrawing.)

9. What **time of day** do you plan to do the Daily Focus sessions? (**Note:** Each session should usually take 5 to 10 minutes.) Please see **More Info.** (*Optional*) [More Info](#)

- ☐ At the end of the working day (late afternoon / early evening - planning for next day)
- ☐ At the end of the day (late evening - planning for next day)
- ☐ At the start of the day (early morning - planning current day)
- ☐ Other (*please specify*):

10. On **which 5 days** of the week do you plan to do the Daily Focus sessions? (**Note:** If planning a day ahead, the planning for a Monday would usually be done on the preceding Sunday or Friday.) (*Optional*)
(select all that apply)

- ☐ Sun
- ☐ Mon
- ☐ Tues
- ☐ Wed
- ☐ Thu
- ☐ Fri
- ☐ Sat

11. On which day will you do your **Strategic Intelligence** session? (**Note:** This is a one-off preparatory activity. You should aim to do this the day before your first Daily Focus session.) (*Optional*)

(DD-MM-YYYY)

12. On which day will you start your **Daily Focus** sessions? (**Note:** You can start any day in your five day sequence.) (*Optional*)

(DD-MM-YYYY)

If you are proceeding with the training, please now continue to the last page.

If you have chosen to withdraw, please answer Questions 13, 14 and 15.

Then simply continue to the last page, then close the tab/browser window and your decision to withdraw will have been noted.

13. **If you choose to withdraw**, you do not need to provide an explanation. You can just type 'n/a'. However if you are happy to do so, any comments explaining your decision would be much appreciated. This could help us improve the programme design or better tailor it to different interests. (*Optional*)

14. **If you choose to withdraw**, would you still like to receive (by email) a report of the eventual findings of the study? (**Note:** This will be available to all participants.) (*Optional*)

- ☐ Yes, I would like to receive a report of the study findings.
- ☐ No, I do not want to receive a report of the study findings.

15. **If you choose to withdraw**, would you be prepared to complete a short ten minute online questionnaire in three weeks time? (*This will help us compare stress related measures for those who do the training and those who don't.*) (*Optional*) [More Info](#)

- ☐ Yes, I will complete the questionnaire.
- ☐ No, I would prefer not to complete the questionnaire.

[Continue >](#)

End of "Training Guidance Notes"

Thank you for reading these notes.

If you are proceeding with the training, when you are ready to start the first activity, the **Strategic intelligence session**, the link is:-

<https://www.survey.bath.ac.uk/strategic/>


PLEASE COPY AND SAVE THIS LINK NOW

Thank you for completing this stage of the study.

If you are withdrawing, thank you for giving this your time and consideration.

Appendix D6: Study 2: Strategic intelligence session

Strategic Intelligence Session



Page 1 of 6

Welcome to your Strategic Intelligence session

This first activity helps you come up with **ideas for reducing stress** that you can apply in the rest of the programme. It usually takes around **30 minutes**, but you can spend whatever time you wish. There are three sections:

- Section 1 - Login.
- Section 2 - Strategic intelligence activities highlighting 4 key ways of reducing stress.
- Section 3 - Key dates to remember in completing the study.

At the end of this activity you will have the option of **printing** a copy of your answers for later reference.

Please note that once you have clicked on the CONTINUE button at the bottom of each page you can not return to review or amend that page.

Continue >

Page 2 of 6

Confidentiality

All data collected in the study is **anonymised**, which means that it will not be possible to identify individuals in any of the analyses or reports produced.

The research is designed to explore links between the frequency of use of the various training activities and changes in participants' well-being. To enhance your privacy and anonymity we would suggest that you just use **initials or abbreviations** rather than names of people or places etc.

The research focus is on which activities are used, not the particular details that participants enter. Thus you can be as cryptic as you like. Whatever you note just needs to make sense to you, not to anyone else.

If you have nothing to write for a particular section - just type 'n/a'.

Continue >

Page 3 of 6

Section 1 - Login

1. Please enter the **participant ID number** you were given.

More Info

2. Please enter **today's date**. (Just click on 'Today' at the bottom of the calendar box. The box appears when you click in the answer space below).

(DD-MM-YYYY)

3. Please enter the **time now** to the nearest minute (e.g 9.06 am, 4.38 pm etc)

Your aim should be to generate ideas to apply in your Daily Focus sessions.

If you can't think of much initially, it's not a problem. Just do what you can.

If you wish you can repeat this activity later, once you've had some experience using the Daily Focus activities.

Continue >

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Section 2 - Strategic Intelligence Activities

The basic questions for you to consider are shown in bold type. (HINTS for how to approach the question are shown in brackets.)

Clicking on the "More Info" button to the right of each question will give you **examples of how others have answered** these types of questions.

In some cases there are also **additional tips** on how to get more out of each question.

You can write as much or as little as you like. The key is that you develop ideas that are useful to you.

4. How can you reduce external pressures that cause you stress?[More Info](#)

(HINTS e.g. What types of occurrences or situations (stemming from external demands i.e. from other people) do you find most stressful, taxing, frustrating, worrying, annoying etc.? What are the root causes? What can and are you doing to gain / exercise more influence / control over your environment(s), so that ultimately you experience fewer of these things you dislike?) (Optional)

5. How can you reduce internal (self-generated) pressures that contribute to stress?[More Info](#)

(HINTS e.g. How might your personal goals or expectations be adding to any pressures or stress? What are you doing or can you do to clarify/simplify what you expect of yourself (e.g. prioritisation, realistic and appropriate goals). (Optional)

6. What personal resources can you develop in yourself to overcome stress?[More Info](#)

(HINTS e.g. What personal attributes, attitudes, skills, knowledge etc., do you feel would help you better deal with stressful situations? What are you doing or can you do to improve your competence/skills in ways that would help?) (Optional)

7. How can you get more help from others?[More Info](#)

(**HINTS** e.g. What kind of practical help and support do you get from others in handling things that stress you? Where and how might this support be better? What are you doing or can you do to improve or make better use of the support that might be available?) (*Optional*)

Having considered these questions, the next step is to decide what you will take forward and try to implement.

For now just choose one or two priorities, things you can definitely see yourself doing.

8. What action(s) will you definitely take to help reduce stress? What's your plan?[More Info](#)

(**HINTS** e.g. From the possible actions you've noted above, where will you start? What will you definitely do? Also, are there any activities or things you can drop i.e. that are not a good use of your time?) (**NOTE:** You should try to come up with at least one clear idea. However if you can't think of anything at this stage, please type 'n/a')

[Continue >](#)

MORE INFORMATION BOX CONTENTS – Question 4

EXAMPLE ANSWERS

External source problem(s)

- (i) Having work tasks unexpectedly dumped on me with really short deadlines.
- (ii) Having to follow poorly designed procedures that take up too much time.
- (iii) Having constant interruptions that stop me getting on with important tasks.

Cause(s)

- (i) There is not enough forward planning or communication about workload and deadlines.
- (ii) I think a lot of procedures have just evolved and been extended overtime and no one has really made an effort to challenge or improve them.
- (iii) I think part of the interruptions are due to the fact that people often don't know where to go for help and just assume it might be part of my job role.

Action(s)

- (i) I'll talk this over with my boss. I'll ask for an indication of what kinds of things are coming up in the next few weeks/months, so that I'll have more time to prepare. I'll also ask for clarification on what the priorities are.
- (ii) I'll get together with some colleagues and see if we can come up with some proposals to modify procedures that don't really work.
- (iii) I'll get clarification from my boss or personnel on what exactly is covered by my role. I need to find out whose responsibility certain things are that I get asked about and signpost people to them straight away, rather than getting involved myself. I can also alter the time I do things, so that I work on difficult things at times when I'm least likely to be interrupted.

MORE INFORMATION BOX CONTENTS – Question 5

EXAMPLE ANSWERS

Self-generated problem(s)

- (i) I often take too long over tasks. And that puts me under time pressure.

- (ii) I'm trying to do too many things at once.

Cause(s)

- (i) I'm a bit of a perfectionist, which is not necessarily a bad thing, as I take pride in doing my job well. But obviously not everything can or needs to be perfect. There may also be an element of insecurity, trying to over deliver, because I'm not really sure what's good enough.
- (ii) Some of the things I'm pursuing are only half thought out. For example, I thought it would be good to learn a foreign language, but I'm not really enjoying the classes or getting anywhere with it. It would be nice to say a few phrases on holiday, but I'm not going to use it for anything beyond that.

Action(s)

- (i) I'm going to get a clearer idea of people's expectations for certain tasks and then just do what's necessary. Each time I start something, particularly a big task, I'll think about how I can keep it simple, how I can cut it down in some way. I'll try it on a few different things and see what happens.
- (ii) I'm going to stop the language classes and spend the time doing something a bit more physical, e.g. just going for some nice walks.

TIPS

- For the perfectionism issue, it might be useful to consider the concept of 'satisficing' as opposed to 'maximising', i.e. being content with something that is 'good enough', as opposed to 'perfect', particularly for peripheral issues.
- If you do want to excel in something, try to frame your ambition/goal in terms of things you can control, e.g. becoming a proficient musician, rather than things you can't, e.g. becoming a famous musician. Developing a skill for its inherent value rather than for something else it might bring, offers deeper and more enduring satisfaction. It also renders your goal less susceptible to external blocks or threats. This in turn reduces your vulnerability to stress.
- This last point illustrates an important distinction between **process goals** and **outcome goals**. At work, a 'process goal' might, for example, be to do your job skilfully and professionally. An 'outcome goal' might be to gain promotion. Both are ways of feeling good about yourself, but 'process goals' are superior in terms of long-term satisfaction and resistance to stress. A promotion may depend on many

things beyond your control and thus can easily be threatened or lost. However, your personal skills, professionalism, integrity, etc., are much more within your control and therefore less vulnerable to threat.

MORE INFORMATION BOX CONTENTS – Question 6

EXAMPLE ANSWER(S)

Additional internal resources

- (i) I want to become even more skilled in what I do. If my IT skills were better, I would be able to work more efficiently. I think there are lots of time-saving features I haven't learnt to use properly.
- (ii) I would like to feel more confident in general. I sometimes find it hard, for example, to say no to people's requests.
- (iii) I would like to be calmer, to take things more in my stride. It would help if I could learn to get less worked up about things and not over-react, which usually only makes things worse.

Actions

- (i) I will look into what IT training courses are available and try to get booked onto one.
- (ii) I will read up on 'assertiveness', either on the Internet or buy a book on it.
- (iii) I'm going to work on being calmer. To help do this, I will take time (Daily Focus sessions) to prioritise and plan better and to avoid having to rush to do things at the last moment. I will also practise not reacting immediately to situations, i.e. operating more in 'rational' mode rather than 'impulsive' mode. This will mean learning to remove myself from situations, taking time out and thinking things through before reacting.

TIPS

It may be helpful in clarifying your objectives to consider the distinction between '**doing**' goals and '**being**' goals outlined below:

- **Doing goals** (also called External / Outcome / What goals) – These goals are generally things you want to achieve in the external world, e.g. completing a work project, reorganising your office, signing up for some training.
- **Being goals** (Internal / Process / How goals) – These goals refer to how you want to act or be in carrying out your various activities, e.g. being calm, relaxed, confident. To 'be' or 'act' a certain way, you need to find or make regular opportunities to practise this.

Note: As it can be difficult to change behaviour on the spot, in the heat of the moment, it helps if you can think ahead and mentally rehearse new ways of acting or reacting. However, be patient with yourself. It takes time to learn new habits or ways of being.

MORE INFORMATION BOX CONTENTS – Question 7

EXAMPLE ANSWER(S)

Additional external resources

- It would be good if we had more of a group or team atmosphere in the office, instead of each of us tending to work head down, doing our own thing. For example, it would help if we discussed any difficulties more and got input or advice from each other.
- Like a lot of my colleagues, I'm not getting on very well with the new photocopier. It's supposed to be able to do all these amazing labour-saving things, but it just seems too complicated and I haven't got time to plough through the manual. It would be helpful if someone who understands it all could give us a demonstration.

Actions

- I'm going to set the ball rolling by asking J's opinion on how best to handle the problem I've been having with L. In return, I'll offer to try to help J if she's having difficulties with anything.
- I'm going to contact the print services unit to see if someone can come to our office and give us 10 or 15 minutes' training on how to do some of the more complex things on the photocopier.

TIPS

- We are surrounded by countless potential sources of help, information and support. These include for example:
 - family
 - friends
 - work colleagues
 - various support teams/departments within our organisations
 - potential support from people in other organisations
 - central and local government support and information services
 - the Internet – offering access to virtually limitless information and contacts
- Whatever issue or problem we're dealing with, there's likely to be someone who can offer practical help, advice or some useful information. So there's no shortage of potential help out there. The problem is often that we just don't look or think to ask. Or perhaps we don't ask the right people. So a bit of thought and imagination can help – as well as initiative. Thus, rather than just waiting and hoping that help might arrive, we need to actively search for it.

MORE INFORMATION BOX CONTENTS – Question 8

EXAMPLE ANSWER

Will definitely do

- (i) I will take more initiative at work, particularly on improving communication with B, to get a better understanding and agreement on work priorities, role clarification, training possibilities, and better sources of support.

Plan for (i)

I aim to make several changes by (*precise date*). I will do this gradually and start with some easy things first. (**Note:** *Don't overload yourself. Consider spreading things out over time, as illustrated below.*)

Week 1

- I will start with a casual chat with B, when things are relaxed (Friday afternoon would be good) and ask him what changes are in the pipeline and how we can best prepare for them.

Week 2

- I will get out my job description and prepare a short summary list of job headings. I will also list all the extra things I've been getting saddled with. I will do this on (precise date). I will then ask B which things he would like me to prioritise and who, in theory, should be doing the extra duties. I will do this on (precise date).

Week 3

- I will see if B will agree to my being trained on X at the start of the new financial year. I'll prepare some justification/arguments for how it should help with our key projects. I will do this on (precise date). If it's not possible, as a back-up plan, I'll see if someone who has done the training can spend twenty minutes showing me some of the basics.

Will definitely drop

- (ii) I will drop the language classes.

Plan for (ii)

I will telephone the language centre tomorrow. I'll see if I can get a rebate for unused classes.

TIPS

- Only focus on actions that you are definitely committed to, i.e. where you can see clear benefits and a feasible course of action.
- Break down long-term goals into simple, small steps that you can take on a daily basis. This usually involves noting down desired or necessary target dates for completion, then working backwards, planning intermediate targets (e.g. what you need to do by the end of this quarter, this month, this week, etc.). **Don't overdo the planning however. Keep it simple.**
- **Focus on what you can control.** When, for example, you make a request of your boss or another colleague, you can't control the other person's response. What you can control is your own behaviour, i.e. in actually making the request and in doing it in a way that hopefully maximises the chances of achieving the kind of the outcome you're aiming for. You can also control how you respond.

Section 3 - Key Dates

It is important that participants start **promptly** and complete the study within similar time scales. Please plan and note your particular dates for the key stages of the study.

The **Daily focus** activities should usually take no more than **5 or 10 minutes** per day.

The two **interim questionnaires** should take about **10 to 15 minutes** each.

The **final questionnaire** should take about **30 to 40 minutes**.

9. On which day will you start your Daily focus writing activities? (NOTE: This should normally be tomorrow.)

 (DD-MM-YYYY)

10. When and where will you be doing your 'Daily focus' each day?

11. On which day do you plan to complete interim progress questionnaire 1?

(Note: This should be completed **1 week** after you started your 'Daily focus' sessions. The ideal time is at the beginning of the 'Daily focus' session that starts your second week of activities.)

 (DD-MM-YYYY)

12. On which day do you plan to complete interim progress questionnaire 2?

(Note: This should be completed **3 weeks** after you started your 'Daily focus' sessions. The ideal time is at the beginning of the 'Daily focus' session that starts your fourth week of activities.)

 (DD-MM-YYYY)

13. On which day do you plan to complete the final questionnaire?

(Note: This should be completed **6 weeks** after you started your 'Daily focus' sessions. This should ideally be 3 full weeks to the day after you completed interim progress questionnaire 2)

 (DD-MM-YYYY)

In a diary or somewhere prominent, please note the time/date you plan to complete each questionnaire.

As mood can fluctuate across the day, please complete the questionnaires at similar times and settings, ideally when you are relaxed and have time to reflect without being interrupted.

You will be emailed the link to each questionnaire on the working day preceding your chosen completion date.

Continue >

End of "Strategic Intelligence" session

Thank you for completing the strategic intelligence session.

The **next step** is to begin your **Daily Focus** sessions on the start date you indicated. The link is:


<https://www.survey.bath.ac.uk/dailyfocus/>

PLEASE COPY AND PASTE THIS LINK SOMEWHERE SO THAT YOU CAN REGULARLY ACCESS THE DAILY FOCUS WEBPAGES

Good luck turning your plans into action!

Appendix D7: Study 2: Daily focus session

Daily Focus



Welcome to your Daily Focus session

This is your moment to **think, note and decide your key actions for the day.**

.

Section 1 - Login.

Section 2 - Developing Perceptual Intelligence:.....1 activity per day.

Section 3 - Developing Tactical Intelligence:.....2 to 3 activities per day

.

You will have the option of **PRINTING** your answers if you would like to retain a copy.

Please note that once you have clicked on the **CONTINUE** button at the bottom of each page you can not return to review or amend that page.

Continue >

Section 1 - Login

1. Please enter the **participant ID** number you were given.

More Info

2. Please enter **today's date**. (Just click on 'Today' at the bottom of the calendar box. The box appears when you click in the answer space below).

(DD-MM-YYYY)

3. Please enter the **time now** to the nearest minute (e.g 9.06 am, 4.38 pm etc)

The Daily Focus routinely takes 5 to 10 minutes a day

Initially it may take longer as you learn the activities. Later you may occasionally need longer when addressing key issues. Sometimes just 2 or 3 minutes may be enough

Be guided by what you want to address, not by set times

Continue >

Section 2 - Perceptual Intelligence

Your Daily Perceptions

Relax, take a deep breath and note how you are currently feeling. Tick the appropriate response for **question 4**. Then focus on whichever of **questions 5 (negative emotion)**, **6 (positive)** or **7 (neutral)** is most relevant.

The basic question for you to consider is shown in bold type. (HINTS for how to approach the question are shown in brackets.)

Clicking on the "More Info" button to the right of each question will give you **examples of how others have answered** these types of questions, plus any **useful tips**.

You can write as much or as little as you like. The key is to **understand the source of your feelings and decide how best to respond**.

4. Please indicate your predominant feeling **now** about how **the past day** has gone.

	Extremely negative	Quite a bit negative	Slightly negative	Neutral	Slightly positive	Quite a bit positive	Extremely positive
a. Predominant feeling / emotion?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

5. If negative, what is or was the problem and its cause? If significant / important, what constructive action can you take?

[More Info](#)

(HINTS e.g. Note briefly what happened. Which of your goals appeared blocked or threatened? What are you adding/assuming? Are there any possible **perceptual biases** [see 'More Info'] contributing to your feelings? What are the facts? What's the most balanced 'rational' assessment you can make at the present time? What can you do to clarify things or make progress towards your goal?) (Optional)

6. If positive, what went well? What action can you take to build on this?

[More Info](#)

(HINTS e.g. What explicit or underlying goal(s) did you make progress with? How did you manage this? What skills/competence did you use? How can you use this again or further develop this?) *(Optional)*

7. If relatively neutral, how could things be improved? What action can you take?

[More Info](#)

(HINTS e.g. Why wasn't it more positive? Was there something key missing e.g. an important goal or issue you're just not addressing? If due to such a goal, is it realistically achievable? If yes, what steps can you take? If no, can you scale down or modify what you're aiming for? Or was the lack of positive feeling due to a lack of novelty, excitement, challenge? If so, how can you take the initiative to make something interesting happen?) *(Optional)*

Try to decide on a **specific action to improve your situation** that you can take forward into the next section, your **daily planning**.

It doesn't matter how **small** it is. Every **step forward** helps. The **simpler the better**.

What exactly will you do?

How will you do it?

When will you do it?

[Continue >](#)

MORE INFORMATION BOX CONTENTS – Question 5

EXAMPLE ANSWER

Situation/problem: I feel quite frustrated and angry. My goal was to get the main sections of the X ... report finished today, but I spent the whole day getting side-tracked by other issues. I can't see how I'm going to have it finished by Friday. I'm worried that it will reflect badly on me (goal of being professional/competent). I'm worried that if I don't perform well, I could be more vulnerable to redundancy (goal of earning a living). But I feel I'm too nice and get dumped on (undermines self-image goal – I want to be more assertive and confident and able to say no more often).

Assumptions/biases: I think most of these negative feelings are coming from the primitive, impulsive part of my brain reacting in a biased way: e.g. **emotional reasoning** (see bias list below), i.e. casting everything in a negative light; also **catastrophizing**, i.e. imagining losing my job. It's also assuming I can't finish the report by Friday, which is not necessarily true.

Facts: I didn't manage to finish the main sections of my report today. This is because I spent a lot of time helping my colleagues with their problems. I haven't done anything wrong or to be ashamed of.

Balanced 'rational' view/interpretation: I'm frustrated because I wanted to have the report ready for Friday. It might still be possible, if I can limit further distractions. Though does it really have to be by Friday? I can ask for more time. I can explain about the help I was giving to colleagues. This doesn't necessarily mean I was being 'dumped on'. It can equally be interpreted as suggesting that I'm clearly someone colleagues feel they can approach for help. That's an asset in an organisation, not a likely cause for redundancy. I just need to be a bit more professional or organised about how I manage interruptions / requests for help.

Actions: I can talk to my boss, see if it's possible to get a few extra days for the report. I can set aside two hours first thing on Wednesday and Thursday, before I start responding to calls and emails. I'll tell others I have to focus on a priority and will talk to them later. I can also see if J could help me with one section. After all, I saved her a lot of time today, sorting out her problem.

BE PREPARED TO BE FLEXIBLE IN YOUR THINKING - THERE ARE MANY WAYS OF INTERPRETING AND RESPONDING TO ANY SITUATION - THE MORE FLEXIBLE YOUR THINKING, THE MORE OPTIONS & FREEDOM YOU'LL HAVE

BIASES (*IMPULSIVE THINKING*) AND REMEDIES (*RATIONAL THINKING*)

CHECKLIST

Bias: Tunnel vision – focusing only on limited or certain aspects of a situation and ignoring other evidence, e.g. a pessimist might pick out only negative information and an optimist, the reverse.

Remedy: Try to weigh up pros and cons, to generate a more balanced, whole picture view.

Bias: Emotional reasoning – basing your view of situations/yourself/others simply on the way you are feeling, ignoring all other evidence.

Remedy: Try to assess all the facts, not just your feelings. Also, where possible, avoid making assessments or key decisions when you're experiencing an extreme mood.

Bias: Jumping to conclusions without adequate evidence – e.g.:

- *Mind reading* – e.g. assuming you know what another person is thinking
- *Predictive thinking* – e.g. assuming that things are going to turn out badly

Remedy: Don't assume. Keep an open mind. Learn to hold off judgement until you have gathered more information.

Bias: Black and white thinking – seeing only one extreme or another, e.g. viewing significant others and/or their actions as either all good or all bad. (This, along with other biases, tends to lead to more stressful interpretations of situations.)

Remedy: Consider evidence offering a more balanced view, acknowledging possible shades of grey.

Bias: Overgeneralization – taking one instance in the past or present and imposing it on all situations (e.g. complaining 'you always ... / never ... ') or labelling yourself or others (e.g. as being 'incompetent'), based on limited evidence and ignoring any facts inconsistent with the label.

Remedy: Be specific in your assessments. Don't rush to generalize or definitively categorise something or someone.

Bias: Catastrophizing – blowing things out of proportion. This often involves jumping to conclusions, imagining an escalating chain of negative implications.

Remedy: Just try to focus and deal with the facts of the immediate situation.

Speculating about a possible chain of implications is just a waste of time. The further you extrapolate into the future, the less accurate you are likely to be. Furthermore, whatever your worst and best case scenarios, outcomes are usually in the middle, far from both extremes.

Bias: Magnification and minimisation – e.g. magnifying others' positive attributes and minimising your own. (Again, this is likely to lead to more stressful interpretations of situations.)

Remedy: Recognise that everyone has strengths and weaknesses and that though you are well aware of your own weaknesses, other people will naturally be trying to keep their weaknesses hidden from view.

Bias: Personalisation – e.g. blaming yourself for things you're not 100% responsible for.

Remedy: Recognise that life is complex and that many people contribute to the events that affect us and others.

Bias: Shoulding and musting – placing unreasonable or excessive demands/expectations on yourself or others.

Remedy: Recognise that there are many ways of doing things and that other people may have very different preferences and expectations, which will be products of their own backgrounds and experiences.

MORE INFORMATION BOX CONTENTS – Question 6

EXAMPLE ANSWER

Situation / what went well

I feel quite pleased with myself about how I handled the meeting yesterday with my supervisor. I've got pretty much the result I wanted. I can now avoid an aspect of my job I don't like and will be doing something I'm more interested in instead.

How it happened / was achieved

I put my points across clearly. I'd prepared well and had it all planned out. I put effort into my rational thinking and used perceptual intelligence skills to see the situation from

my supervisor's perspective and imagined what her priorities or concerns might be. I'd anticipated how she might respond and had suggestions ready. I think this has taught me that I don't have to passively keep putting up with things (inappropriate habitual self) that I feel uncomfortable with. There are other, better options I can take. I just have to think them through and take action. It also showed I can negotiate quite well if I put my mind to it.

Further actions

To build on this, I'm going to ask M if she would like to come up with some ideas with me on how we might be able to simplify the booking and reservation procedures. I'm going to use perceptual intelligence again, seeing things from management's perspective and how their concerns might be addressed. I know my job inside out and have got some good ideas. The head of the department might not be able to agree to everything, but we should be able to come up with some improvements, which should make things easier for us and our clients.

TIPS

- Perceptual intelligence is about developing flexibility in:
 - what information/evidence you choose to focus on in situations (i.e. not just one extreme, e.g. the bad points)
 - the viewpoints you consider (i.e. not just your own)
 - what you do with the information you take in (i.e. consider more than one way of interpreting it)
- Generally, you should find you'll make better progress towards your goals, the more your thinking is:
 - open-minded rather than closed
 - flexible rather than fixed
 - constructive rather than defeatist
 - pragmatic rather than fanciful/wistful
 - accepting reality and dealing with it rather than wishing it wasn't so
 - systematic/organised rather than haphazard/sporadic
 - present or future focused rather than past
 - addressing what can rather than cannot be changed
 - **i.e. more rational thinking than impulsive thinking**
 -

MORE INFORMATION BOX CONTENTS – Question 7

EXAMPLE ANSWER

Situation

Work was OK today. I just feel a bit flat. I'd like a bit of excitement, something to look forward to. All I have this weekend are some forms to fill in, which I keep putting off.

Cause

I've not really put any effort into my social or family life recently. I'm just tired when I get home from work. And as nothing seems to be happening in my social/leisure time, I just seem to be living for work. There's no counterbalance to work.

Actions

- (i) I'm going to stop procrastinating about the forms. I'm going to get them out of the way first thing Saturday morning, so I've got the rest of the weekend free.
- (ii) I'm going to phone some friends before the weekend and see if anyone's free to meet up Saturday evening.
- (iii) On Sunday, I'm going to phone up G. We haven't been in touch for months. I'll see how she's doing and ask if she'd like to come and visit one weekend.
- (iv) I'm also going to try to introduce some positive things into my working day, e.g. a walk at lunchtimes.

TIPS

- We feel good having nice things to look forward to. If positive events don't seem to be coming your way, stop waiting for them to happen and take the initiative. Organise something different for your family, friends or work colleagues. If you can't think of anything, invite someone else to suggest something. Even if what they suggest might not necessarily be the kind of thing you had in mind, consider giving it a try.
- From time to time, it's good to get a change of environment or perspective. So try to get away now and again. It doesn't need to be expensive or far, just different. Different things you could try include:
 - seeing a different type of film (e.g. a novel foreign language)

- reading a different type of book
 - trying some different food from the supermarket
 - trying to cook a different dish
 - trying a different type of wine
 - trying a different type of exercise activity
 - doing something unexpected/spontaneous for someone you love, e.g. a treat when it's not their birthday
- Using your imagination (i.e. challenging your 'habitual self'), you can also try to introduce more pleasant experiences/rewards (e.g. after completing tasks) into your working day. These can be whatever you enjoy / find appealing, e.g.:
 - trying something new (e.g. yoga class in lunch break)
 - going for a walk, getting some fresh air, after completing a task
 - investing more time in a friendship with a colleague whose company you enjoy

[NOTE: Your 'impulsive self' is only problematic when it is working against your best interests (often in situations of stress). Impulsivity can of course be a positive force, when it enhances your life situation, e.g. spontaneous acts of kindness.]

Section 3 - Tactical Intelligence

Your Daily Plan

The 6 questions below are designed to **stretch your thinking** in different directions to help you make a **more effective** daily plan.
Questions 8 and 9 can apply everyday. The rest depend on the issues you face. To keep things **fresh**, occasionally try **different** questions.
If you're stuck for **ideas**, click on the relevant '**More Info**' box.

8. What key things will you do?

[More Info](#)

(HINTS e.g. What are the absolute minimum essential things you need to remember to do / accomplish today/tomorrow? How will you ensure you do this? What non-essential things can you drop or reduce to a minimum?) *(Optional)*

9. When is the best time to do them?

[More Info](#)

(HINTS e.g. Where you have flexibility/scope, how are you going to order and time your activities for optimal **task efficiency**? Also for optimal **motivational efficiency** e.g. starting with a **tough investment** (difficult but necessary), followed by **pleasant investments** (necessary but also enjoyable) and **positive withdrawals** (enjoyable rewards/breaks)? [see 'More Info']
(Optional)

10. How can you make life / things easier?

[More Info](#)

(HINTS e.g. How can you be more efficient/effective in what you're aiming to do? What specific steps/actions can you take to **reduce the task demands** [internal/external] and/or **increase the resources** [internal/external]?) *(Optional)*

11. How can you be smarter, more creative?

[More Info](#)

(HINTS e.g. Are there any creative ways you can circumvent any potential problems e.g. finding an alternative route to achieving a particular end or goal? **Challenge assumptions!** Does it have to be done like this? Is there a simpler way? Challenge your reservations! Is a particular mental barrier really a problem? Also consider how situations might offer hidden benefits or opportunities to satisfy other goals.) *(Optional)*

12. What little extra can you add today for one of your own longer term strategic goals?

[More Info](#)

(HINTS e.g. What little thing can you add in / combine with other activities today, to advance a **Strategic intelligence being** goal (e.g. being more calm, confident, kind) or **doing** goal (e.g. taking the next small step towards a longer term objective). Focus on one issue. Be **concrete/specific** about what you will do and when.) *(Optional)*

13. How can you shape your physical and social environment to help you?

[More Info](#)

(HINTS: e.g. How can you use prompts to avoid forgetting to do things? Can you reduce or remove temptations, unhelpful distractions? What positive influences can you introduce into your work/living space? Can you improve ways of interacting with your environment e.g. healthier habits/routines?. How can you help create a more supportive co-operative atmosphere around you?) *(Optional)*

Now note the key things you've decided on a list, diary, personal organiser etc so that you are clear on your plan for the day and have something to remind you / keep you on track.

Keep it simple! Just do what you feel comfortable with each day.

And be kind to yourself. Recognise that not everything you try may work, but a lot will. So congratulate yourself on any progress you make!

14. Roughly how confident are you that you can do the things you have planned for the day ahead?

☐ zero per cent.....
 ☐ 25 per cent.....
 ☐ 50 per cent.....
 ☐ 75 per cent.....
 ☐ 100 per cent

[Continue >](#)

Survey testing only

[Check Answers & Continue >](#)

Daily Focus



End of "Daily Focus" session

Thank you for completing your session today.

Good luck turning your plans into action!

MORE INFORMATION BOX CONTENTS – Question 8

EXAMPLE ANSWER

Essential to do

1. Number one priority is to get my application sent off today. So that means definitely going to the post office sometime today.
2. Spend at least one hour working on the new KCG spreadsheet.
3. I'm also going to make time for a walk, to have a break from the office and get some exercise.

Non-essential to drop

1. I'm going to excuse myself from the R meeting, as I have nothing to contribute this week.

TIPS

- You may find it useful to carry a notepad (or alternative that works for you) for jotting things down as they pop into your head during the day. You can then review these during your Daily Focus session.
- A key benefit of listing things you need to do is that it gives you **reassurance and control**. This avoids the stress of your 'impulsive self' worrying about forgetting things. It also avoids last minute panics or frustration from realising that you've forgotten to do something. Your 'rational self' has it all under control!
- To avoid unnecessarily long lists, don't note down obvious, routine things that will happen automatically. Note just the things you need to remember.
- Keep your list to hand and regularly consult it through the day.

Note: This activity is based on our common tendency to draw up lists, e.g. shopping lists. But as you'll see using the various TI activities, noting and listing can be used to do so much more than just remembering what to buy. For example, they can help you remember:

- what to do
- what to say, particularly in a difficult situation
- what arguments to use
- what to ask

- what time to act
- how to act
- where to go
- what order or sequence to do things in
- what to remind yourself of to boost your confidence

In the heat of the moment, it's so easy to forget what you planned, or the simplest of things. So make your lists work for you.

MORE INFORMATION BOX CONTENTS – Question 9

EXAMPLE ANSWERS

Optimising task efficiency / time use

E.g. I'll take my break early at 11.45 am to avoid lunchtime queues at the post office.

E.g. I'll get everything ready to leave in good time, briefcase packed, coat on, then will just sort through emails until the taxi arrives.

Optimising motivational efficiency

E.g. I'm going to start the day with a **tough investment** that I've been putting off. Before having a coffee or checking emails or answering calls, I'll get straight into the KCG spreadsheet and spend a solid 45 minutes making a start on sorting out the problems. I'll then reward myself with a coffee/tea, before opening up my emails and responding to any missed calls. I'll then work for an hour solid on a **pleasant investment**, planning the social events for the group conference. For a **positive withdrawal**, I'm going to go for a walk this lunchtime in the sunshine. Also, this evening once I've sorted chores, I'm going to treat myself to (film) on BBC i player.

TIPS

Optimising task efficiency / time use

- There are lots of ways to save time / do tasks more efficiently, if we just put some thought into it, i.e. activating our 'rational self' rather than 'habitual self', e.g.:
 - avoiding crowds, peak times
 - doing things in good time to avoid last minutes rushes or forgetting things
 - planning something constructive to do in waiting periods
 - combining tasks, killing two birds with one stone

Optimising motivational efficiency

- Our actions each day can be viewed as either taking present enjoyment (**withdrawals**) or working to ensure future enjoyment (**investments**). The former can be **positive** (e.g. taking a walk, meditating, chatting with a friend) or **negative** (e.g. smoking, drinking to excess). The latter (i.e. investments) can be **tough** (e.g. sorting out your tax return / bills) or **pleasant** (e.g. tackling a work project you enjoy).
- It's easy to motivate ourselves for things we enjoy, but difficult for things we don't enjoy, i.e. 'tough investments'. Our rational self acknowledges they need to be done. Our impulsive self tries to avoid them. It takes will power to impose rational drives over impulsive drives. As will power is a limited resource, it's best to attempt this when our will power is strong and impulsive drives weakest, e.g. first thing in the morning or after a break. Note that impulsive drives (i.e. desire for some instant positive withdrawal/treat/reward) are strongest when we're tired or progress towards a goal has been frustrated, creating a negative mood. The impulsive self doesn't have much patience, so it also helps to set clear limits on the time you intend to spend on the 'tough investment' and have a reward in store after completion for the impulsive self to look forward to.
- This way of planning your tough investments should make them easier to approach. Also, addressing such issues promptly rather than postponing them for weeks or even months, should stop small problems growing into bigger ones (e.g. postponing tackling a debt problem or a backlog of work).

MORE INFORMATION BOX CONTENTS – Question 10

EXAMPLE ANSWER

REDUCING DEMANDS

Internal Demands: The document I'm working on doesn't need to be perfect. It's just a first draft. I was asked for an outline. A lot is likely to be revised later. So I'm not going to spend ages getting the wording right. I'll make it clear to X that this is just a draft.

External Demands: As I won't receive all the information I need this week, I'll propose to X that I just submit the elements I have, and will ask P and V to submit their elements directly to X.

INCREASING RESOURCES

Internal Resources: I'm going to request some IT training to help me design complex graphics more quickly/effectively. I think I could be quite good at it and it'll be a useful skill to have.

External Resources: In the meantime, I'm going to ask C if she can help me with a couple of complex charts. I can offer to help her with her backlog of filing in return, which I know she hates.

TIPS

The process of reducing demands and increasing resources is sometimes referred to as **problem rebalancing**. The purpose is to make it easier to progress towards your goals. This is explained below:

1. **Reducing demands** – Use your imagination to generate ideas for ways in which the size or nature of tasks or problems might be reduced. The more systematic you can be, the more options you are likely to discover. A useful way to structure your thoughts is to work through the following headings:
 - **Internal demands** – To what extent are the demands of the problem a function of your own expectations for yourself? Here it might be useful to consider the concept of 'satisficing' as opposed to 'maximising', i.e. being content with something that is 'good enough' as opposed to 'perfect', particularly for peripheral issues. Compromise is important. We tend to have a mental picture of what we're aiming for. If the complete picture is unattainable, the core essence might still be, if we're prepared to give up on some of the peripheral detail.
 - **External demands** – To what extent are the demands externally imposed? With a work-based problem, the demands might be imposed by your boss. If there's uncertainty, you may need to test your assumptions about just what exactly is required. If it's clear what your boss expects, and you feel this is too much, see if you can negotiate. What are the priorities? What are possible areas for compromise? If time is tight, don't just automatically accept deadlines you've been given. Question the time scales. Just what exactly is needed by when? Try renegotiating deadlines wherever feasible. Search for possible compromises. It might not work in all situations, but it should in some. So give it a try.

2. **Increasing resources** – Note down ways in which your resources might be greater than you think, or could be increased. Again, try to work through your options in a systematic way:
- **Internal resources** – These might include: your general knowledge / know-how; work or technical skills; personality attributes, e.g. perceptiveness, perseverance, resourcefulness, sense of humour, organisational ability, etc.; social skills, e.g. ability to seek/accept help from others. The solution may be simply to recognise and make more use of your existing resources, or to develop additional resources/skills. (N.B. The more resources you can develop through life, the greater your resilience.)
 - **External resources** – These might include: accessing various sources of information; getting help from family, friends, work colleagues, support groups, public services/agencies, etc. Also, try to identify ways you might be able to use your time more efficiently. Don't just dive into tasks. Try to think things through beforehand, to figure out the best approach.
3. **Being creative** – Try to think of novel approaches, i.e. things you might not have tried before. Don't be too quick to reject ideas. If sceptical about a possible course of action, focus on how you could make it work. Try out new approaches. Experiment a little. See what happens and what you can learn.
4. **Next steps** – Whatever solution you decide upon, note down what exactly you're going to do and when. Action is essential. Turn your thoughts and plans into action: **Thinking → Noting → Doing!**

MORE INFORMATION BOX CONTENTS – Question 11

EXAMPLE ANSWER

Problem

I've been getting frustrated with W, because he said he would help me organise this month's social event, but he just keeps avoiding me.

Challenging assumptions

Do I really need to rely on W? Perhaps I can find someone else interested in helping. Do we really need to have these events every month? How about every other month? Does it have to be the same person, i.e. me, that organises it? How about if we

alternate who organises it? That way it's not too burdensome for one individual and we might get a bit more novelty and variety.

TIPS

Note: Creativity is not a rare, mystical talent. It's simply about generating ideas, alternative options, for yourself. To develop your creativity, you need to:

1. Become more aware of your own 'habitual' ways of thinking and doing things.
2. Challenge the belief that there is only one way of doing things. What might have been appropriate in the past, may no longer be the most appropriate approach now.
3. Define your problem broadly rather than narrowly, to give yourself more options for finding solutions. For example, with the problem cited above, the narrow definition of the problem was: 'I can't get W to help me organise this month's social event.' A broader definition was: 'I am having difficulty organising these monthly social events.' This more general framing of the problem opens up consideration of more options than simply trying to persuade W to help, e.g. getting others to help, organising fewer events, alternating responsibility, etc.
4. Try to think of novel approaches, i.e. things you might not have tried or considered before. Look at the situation from different angles or perspectives. For example, how might someone you admire tackle the problem? If you can't think of anything immediately, resolve to do something that might help, e.g. a change of environment to get a fresh perspective, or talking to others you think may be able to help.
5. List alternative options. Don't be too quick to reject ideas. That's often your 'impulsive self'. Allow yourself time to run with ideas, to explore their potential. If sceptical about a possible course of action, consider how you could perhaps make it work. Despite initial apparent drawbacks, there may be other compensations to weigh in the balance. Challenge any constraints you might have in your mind. Try to stretch your thinking. Be bold. Be curious. Explore possibilities.

MORE INFORMATION BOX CONTENTS – Question 12

EXAMPLE ANSWERS

Note: Two goals are illustrated below. The norm would be to focus on just one per day.

Strategic intelligence: being goal

Being kind/considerate – I know M is worried about her father's health. I'm going to invite her to lunch tomorrow, to see how she's doing and to give her a bit of support.

Strategic intelligence: doing goal

I'm going to talk to my other team members, to see if we can come up with a list of suggestions to put to the head of our department to simplify the new procedures.

Note: The **being** goals also involve actions, since to 'be' a certain way involves 'acting' in that way. So for example, to be a kind person involves more than just labelling yourself as such. You need to find or create opportunities to act in a kind way. The same applies to any other personal attribute you want to develop.

TIPS

So often we have ideas we'd like to pursue, but never quite find the time to do them. This activity helps us make a start. Just a little effort in a particular direction each day can have a big cumulative effect over the longer term. For example:

- Frequent small acts of warmth/generosity/kindness can help build friendlier, more supportive environments at work, home, etc.
- Learning something new each day (e.g. bits of information, procedures, techniques, etc.) can eventually build into considerable skills/expertise.

MORE INFORMATION BOX CONTENTS – Question 13**EXAMPLE ANSWERS****Prompts**

- I'm going to keep my Daily Focus plan to hand all the time and regularly refer and/or add to it.
- I'm going to put up a time plan on the wall, so that I keep deadlines clearly in view and can prepare in advance.
- I'm going to put a picture up next to my PC to remind me to sit upright with good posture. I'm also going to get a little timer to remind me to get up every half hour for a stretch.

Removing distractions / temptations

- I'm going to clear out all the clutter and tidy up my workspace, so I can find stuff more easily.
- As I tend to snack on (unhealthy foods) late at night, I'm going to stop buying them and will substitute them with (healthier options).
- I'm going to cut back on my satellite TV subscriptions, so I'm not tempted to watch so much TV.

TIPS


Your environment has a constant influence on you every day. So a key step in reducing stress is to modify your environment, so that it helps rather than hinders you in what you want to do. Here are some examples:

- Placing reminders in prominent places, so you don't forget something crucial.
- Placing objects (e.g. photos, quotations) in your environment that inspire and motivate you.
- Feeding your brain with stimulating ideas, e.g. seeking out books, programmes, experiences, that take you in the direction you want to go.
- Taking steps to keep temptations (e.g. unhealthy foods) out of mind / out of reach.
- Getting your body onside, e.g. improving your posture to feel more assertive.
- Challenging habitual ways of interacting with your environment. For example, instead of getting a bus all the way to your destination, try getting off a few stops sooner for a bit of a walk when the weather is good. Use stairs rather than lifts or escalators.
- Asking others for ideas. Or better still, get them involved too. Work on creating the kind of supportive and positive environment you want around you.

Don't just accept your environment as it is. Shape it so that it helps you get more of what you want out of life.

Appendix D8: Study 2: Interim progress questionnaire 1 (Time 2)

Interim Progress Questionnaire 1



Page 1 of 11

Welcome to Interim Progress Questionnaire 1

Thank you very much for your effort so far.

This is the first of the **two interim progress questionnaires**. There are **7 sections** to complete. It should take about **15 minutes**.

Continue >

Page 2 of 11

Please remember that once you have clicked on the CONTINUE button at the bottom of each page you can not return to review or amend that page.

Login

1. Please enter the **participant ID number** you were given.

More Info

2. Please enter **today's date**.

(DD-MM-YYYY)

3. Please enter roughly what **time** it is now (e.g 10am, 9.15pm etc)

Continue >

This was followed by the scales below in the order shown:

PNES – 12; PSS – 10; HADS – 14; GOSS – 6; GSE – 10.

Page 8 of 11

Section 6

The 4 questions in this section address your use of the **KEY IDEAS** presented in this training programme.

Please choose the one response to each question that most closely represents your experience so far.

51. The 'Impulsive / Rational / Habitual self' explanation in the training guidance notes aims to help you better identify and balance your different modes of thinking.

How have you used these ideas so far?

- I skimmed this and haven't really put much thought into it.
- I read it, but didn't really understand it.
- I read it and understood it, but it didn't really interest / appeal to me.
- I read it and understood it, but haven't thought of actions I can take to apply it.
- I read it, understood it and have thought of actions I can take to apply it.
- I read it, understood it and have begun to take action to apply it.
- Other (please specify):

52. The 'Strategic Intelligence' component is about seeing the bigger picture, the longer term and identifying changes you can make or work towards to improve your situation.

How have you used these ideas so far?

- ☐ - I skimmed this and haven't really put much thought into it.
- ☐ - I read it, but didn't really understand it.
- ☐ - I read it and understood it, but it didn't really interest / appeal to me.
- ☐ - I read it and understood it, but haven't thought of actions I can take to apply it.
- ☐ - I read it, understood it and have thought of actions I can take to apply it.
- ☐ - I read it, understood it and have begun to take action to apply it.
- ☐ Other (please specify):

53. The 'Perceptual Intelligence' component is about better interpreting and learning from your emotional reactions and deciding how best to respond.

How have you used these ideas so far?

- ☐ - I skimmed this and haven't really put much thought into it.
- ☐ - I read it, but didn't really understand it.
- ☐ - I read it and understood it, but it didn't really interest / appeal to me.
- ☐ - I read it and understood it, but haven't thought of actions I can take to apply it.
- ☐ - I read it, understood it and have thought of actions I can take to apply it.
- ☐ - I read it, understood it and have begun to take action to apply it.
- ☐ Other (please specify):

54. The 'Tactical Intelligence' component is about exploring different ways in which you can take constructive action to improve your situation.

How have you used these ideas so far?

- ☐ - I skimmed this and haven't really put much thought into it.
- ☐ - I read it, but didn't really understand it.
- ☐ - I read it and understood it, but it didn't really interest / appeal to me.
- ☐ - I read it and understood it, but haven't thought of actions I can take to apply it.
- ☐ - I read it, understood it and have thought of actions I can take to apply it.
- ☐ - I read it, understood it and have begun to take action to apply it.
- ☐ Other (please specify):

Continue >

Page 9 of 11

Section 7

55. What has been the most useful part or aspect of the training and activities so far? (NOTE: If you can't think of anything, just type 'n/a')

56. Has there been anything different or unusual over the past week or so that may have affected your stress levels over and above the training activities? If yes, please explain briefly. (If no, please type 'none')

Continue >

Tips for ongoing Daily Focus sessions

Thank you for completing the questions. Here are some reminders to help you make the most of your Daily Focus sessions.

1. Impulsive / Rational / Habitual Self

- The key idea is to use more rational thinking and constructive 'adult' action to improve your situation.

2. Strategic Intelligence

- The key is to develop a clear and realistic view of the direction and actions you need to take to improve your long term situation.
- The subsequent Daily Focus sessions address how you do this day by day.

3. Perceptual Intelligence

- The key is to get a balanced, rational view of what's triggering your emotions.
- This involves trying to identify the source of your feelings and challenging possibly biased impulsive interpretations of events/people etc.

- The end result should be deciding the most constructive course of action to improve your situation.

4. Tactical Intelligence

- The aim is to clarify exactly what you want from your day and how you're going to achieve this. Note the key actions you'll take and when. Be specific and realistic.
- Much stress is self-generated and so there should be many things within your control to work on. Be disciplined. Keep to the times you set for things and try to avoid being side-tracked.
- For things beyond your control e.g. others' behaviours/reactions, there are of course no guarantees. Others have the right to make their own decisions, and sometimes may act irrationally or impulsively.
- However the better you plan, and the more rational constructive and 'adult' your approach, the greater your chance of success.

[Continue >](#)

Interim Progress Questionnaire 1



End of Interim Progress Questionnaire 1

Thank you very much for completing this questionnaire.

You will receive the link to the second progress questionnaire 2 weeks from now.

Good luck with your ongoing Daily Focus sessions. Different activities will suit different problems/situations. So try to be flexible in your approach.

Appendix D9: Study 2: Interim progress questionnaire 2 (Time 3)

Interim Progress Questionnaire 2



Page 1 of 11

Welcome to Interim Progress Questionnaire 2

Thank you very much for your effort so far.

This is the second of the two interim progress questionnaires. There are 7 sections to complete. It should take about 15 minutes.

[Continue >](#)

Page 2 of 11

Please remember that once you have clicked on the CONTINUE button at the bottom of each page you can not return to review or amend that page.

Login

1. Please enter the participant ID number you were given.

[More Info](#)

2. Please enter today's date.

 (DD-MM-YYYY)

3. Please enter roughly what time it is now (e.g 10am, 9.15pm etc)

[Continue >](#)

This was followed by the scales below in the order shown:

PNES – 12; PSS – 10; HADS – 14; GOSS – 6; GSE – 10.

Page 8 of 11

Section 6

The 6 questions in this section address your use of the TACTICAL INTELLIGENCE activities in your DAILY FOCUS sessions.

Please choose the one response to each question that most closely represents your experience so far.

51. The - 'What key things will you do / not do?' - activity is about setting your priorities for each day.

How have you used this activity so far?

- ☐ - I haven't really considered or thought about this activity.
- ☐ - I have considered this activity but am not quite sure how to use it.
- ☐ - I know how to use it, but it hasn't been appropriate / necessary.
- ☐ - I have used this activity, but not very successfully i.e. it wasn't helpful.
- ☐ - I have used this activity successfully i.e. it was helpful.
- ☐ Other (please specify):

52. The - 'When is the best time to do them?' - activity is about optimising how you organise tasks and how you motivate yourself to do them.

How have you used this activity so far?

- ☐ - I haven't really considered or thought about this activity.
- ☐ - I have considered this activity but am not quite sure how to use it.
- ☐ - I know how to use it, but it hasn't been appropriate / necessary.
- ☐ - I have used this activity, but not very successfully i.e. it wasn't helpful.
- ☐ - I have used this activity successfully i.e. it was helpful.
- ☐ Other (please specify):

53. The - 'How can you make life / things easier?' - activity is about reducing demands and increasing resources needed to complete particular tasks.

How have you used this activity so far?

- ☐ - I haven't really considered or thought about this activity.
- ☐ - I have considered this activity but am not quite sure how to use it.
- ☐ - I know how to use it, but it hasn't been appropriate / necessary.
- ☐ - I have used this activity, but not very successfully i.e. it wasn't helpful.
- ☐ - I have used this activity successfully i.e. it was helpful.
- ☐ Other (please specify):

54. The - 'How can you be smarter, more creative?' - activity is about challenging assumptions and coming up with alternative ways of doing things.

How have you used this activity so far?

- ☐ - I haven't really considered or thought about this activity.
- ☐ - I have considered this activity but am not quite sure how to use it.
- ☐ - I know how to use it, but it hasn't been appropriate / necessary.
- ☐ - I have used this activity, but not very successfully i.e. it wasn't helpful.
- ☐ - I have used this activity successfully i.e. it was helpful.
- ☐ Other (please specify):

55. The - 'What little extra can you add today for one of your strategic goals?' - activity is about ensuring you take regular daily steps towards your longer term goals.

How have you used this activity so far?

- ☐ - I haven't really considered or thought about this activity.
- ☐ - I have considered this activity but am not quite sure how to use it.
- ☐ - I know how to use it, but it hasn't been appropriate / necessary.
- ☐ - I have used this activity, but not very successfully i.e. it wasn't helpful.
- ☐ - I have used this activity successfully i.e. it was helpful.
- ☐ Other (please specify):

56. The - 'How can you shape your physical and social environment to help?' - activity is about creating a more positive / supportive environment around you.

How have you used this activity so far?

- ☐ - I haven't really considered or thought about this activity.
- ☐ - I have considered this activity but am not quite sure how to use it.
- ☐ - I know how to use it, but it hasn't been appropriate / necessary.
- ☐ - I have used this activity, but not very successfully i.e. it wasn't helpful.
- ☐ - I have used this activity successfully i.e. it was helpful.
- ☐ Other (please specify):

[Continue >](#)

Section 7

57. Through doing your Daily Focus sessions do you feel any different in terms of your ability to cope with problems or sources of stress?

If yes, please briefly describe any difference felt.

If no (or even if you answered 'yes') are there any particular areas or aspects of coping with stress that you'd still like to improve? And if so what? (If not, please type 'n/a'.)

58. Has there been anything different or unusual over the past week or so that may have affected your stress levels over and above the training activities? If yes, please explain briefly. (If no, please type 'none')

59. How much longer do you wish to continue with your Daily Focus sessions? (NOTE: The more you practise the activities, the more automatic and effortless they should become.)

- ☐ I wish to continue my Daily Focus sessions for just one more week (i.e. 5 more sessions)
- ☐ I wish to continue my Daily Focus sessions for three more weeks (i.e. 15 more sessions)

60. For your remaining Daily Focus sessions, what are your priorities i.e. what key issue(s), problem(s) or goal(s) will you concentrate on? (If you can't think of anything, just type n/a.)

Continue >

Tips for remaining Daily Focus sessions

Thank you for completing the questions. Here are three tips to help you make the most of your remaining Daily Focus sessions.

1. The Daily Focus sessions are about 'THINKING, NOTING and DOING'. The first two are just preparation. The third is the key i.e. TAKING CONSTRUCTIVE STEPS TO IMPROVE YOUR SITUATION.

2. The better your thinking, the better your options for action. Give yourself time to consider different possibilities and think things through. Do a few activities in depth each day rather than many superficially.

3. Occasionally re-read the tips and illustrations in the 'MORE INFO' boxes. They should help you get more out of each activity.

Continue >

Interim Progress Questionnaire 2




End of Interim Progress Questionnaire 2

Thank you very much for completing this questionnaire.

Whether you have chosen to do 5 more or 15 more Daily Focus sessions, you will receive the link to the final questionnaire in 3 weeks' time.

Good luck with your remaining Daily Focus sessions. Remember the key is to TAKE ACTION to try to improve your situation

Appendix D10: Study 2: Final questionnaire 2 – Parts 1 & 2 (Time 4)

Final Questionnaire Part 1

Page 1 of 10

Welcome to the Final Questionnaire Part 1

Thank you for the time and effort you have put into this research study. We hope you have found it interesting and helpful.

Lessons learnt from the study will be reported back to you when all the analyses have been completed.

As with the introductory questionnaire, this final questionnaire has been divided into 2 parts. You can do both parts in one go, or take a break between the two if you prefer.

There are **7 sections** to this first part. It should take about **10 to 15 minutes** to complete. The second part should take a similar time.

[Continue >](#)

Page 2 of 10

Please note that once you have clicked on the **CONTINUE** button at the bottom of each page you can not return to review or amend that page


Login

- Please enter the **participant ID number** you were given.[More Info](#)
- Please enter **today's date**.
 (DD-MM-YYYY)
- Please enter roughly what **time** it is now (e.g 10am, 9.15pm etc).

[Continue >](#)

This was followed by the scales below in the order shown:

PNES – 12; PSS – 10; HADS – 14; GOSS – 6; HINT – 12; W-BNS – 18; GSE – 10.

Final Questionnaire Part 1

Page 10 of 10

End of Part 1

Thank you for completing Part 1.

The link to Part 2 is:

<https://www.survey.bath.ac.uk/final-2>

IF TAKING A BREAK BEFORE COMPLETING PART 2, PLEASE COPY AND SAVE THIS LINK.

Welcome Back

Thank you for completing Part 1.

There are **6 sections** to Part 2. It should take about **15 minutes** to complete.

[Continue >](#)

Please note that once you have clicked on the CONTINUE button at the bottom of each page you cannot return to review or amend that page.

If you cannot think of an answer to a particular question, just type 'n/a'.

Login	
1. Please enter the participant ID number you were given.	More Info
<input type="text"/>	
2. Please enter today's date .	
<input type="text"/>	(DD-MM-YYYY)
3. Please enter roughly what time it is now (e.g 10am, 9.15pm etc)	
<input type="text"/>	

[Continue >](#)

This was followed by the scales below in the order shown:

LOT-R – 10; ISEL – 12.

Section 5

20. Has there been anything different or unusual over the past week or so that may have affected your stress levels over and above the training activities? If yes, please explain briefly. (If no, please type 'none')

21. What key thing or things, if any, has the training in this study helped you make progress with? (e.g. particular goals, issues, problems etc.)

22. Which aspects of the training (e.g. ideas, techniques, activities) were most helpful in achieving this progress or which aspects were most useful generally?

[e.g. **impulsive/rational/habitual self** (i.e. understanding different modes of thought); **strategic intelligence** (i.e. clarifying long term goals for improving your situation); **perceptual intelligence** (i.e. understanding positive/negative/neutral emotions); **tactical intelligence activities**:- (e.g. prioritising; improving timing; rebalancing demands/resources; thinking smarter, more creatively; adding little extras for long term goals; shaping your environment); or **other particular aspects**.]

23. What key difficulties did you encounter, if any, in trying to use the training / activities? (If none, please type 'n/a').

24. What key problem(s) or source(s) of stress remain unresolved? (i.e. What haven't you found time to address or what haven't you been able to resolve / make progress with?)

25. For your most significant remaining problem or key source of stress (identified above), which one of the following statements most closely represents your view regarding being able to overcome the problem / source of stress?

- ☐ The problem / issue is mainly within my control. I have the necessary skills and resources and am confident I will eventually solve the problem.
- ☐ The problem / issue is potentially within my control. I just need to acquire and develop the necessary skills and resources to be able to solve the problem.
- ☐ The problem / issue is mainly within other people's control, but I can still influence outcomes to a reasonable / satisfactory extent.
- ☐ The problem / issue is mainly within other people's control, but with better skills / resources I could probably influence outcomes to a reasonable / satisfactory extent.
- ☐ The problem / issue is mainly within other people's control. I cannot realistically expect to influence outcomes to any reasonable / satisfactory extent.
- ☐ The problem / issue is within no one's control. What happens is mainly down to chance, luck, fate, genes etc., but I can take action to increase my chances of achieving a satisfactory outcome.
- ☐ The problem / issue is within no one's control. What happens is mainly down to chance, luck, fate, genes etc., but with better skills / resources I could probably take action to increase my chances of achieving a satisfactory outcome.
- ☐ The problem / issue is within no one's control. What happens is mainly down to chance, luck, fate, genes etc., and nothing I can do will ultimately make much of a difference to eventual outcomes.
- ☐ Other (please specify):

26. How could the training be improved (e.g. made easier to use, more effective, or more extensive in helping you deal with stress)?

27. What time of day did you eventually settle on for your Daily Focus sessions? Were there any particular advantages / disadvantages associated with doing the activities at this time of day?

28. For you personally what would be the ideal frequency of Daily Focus sessions (e.g. everyday, every work day, intermittently, other...)? What would your reasoning be for this?

Continue >

Section 6

29. It is common practice in research to sometimes use participants' anonymised quotes (e.g. from questionnaires / online training activities etc) in reports, publications, presentations or training materials to illustrate particular themes or issues. As indicated in the participant information sheet at the start of the study, we will only use the data in this way if participants give their permission.

(NOTE: Participants' responses in the online training activities etc., are normally already anonymised by participants themselves. However wherever necessary we will take steps to further anonymise the data to ensure that any quotes used only illustrate general issues and cannot be linked to particular individuals or situations.)

Do you give your permission for the data to be used in this way?

- ☐ Yes, I give my permission, provided any quotes are completely anonymised (i.e. cannot be linked to any particular individual or situation).
- ☐ No, I do not give my permission.
- ☐ Other (please specify):

30. Would you like to receive a report of the study findings? (Note: This will be emailed to participants.)

- ☐ Yes
- ☐ No
- ☐ Other (please specify):

31. Many studies have a 6 month follow up to assess any longer term effects of training programmes.

Would it be OK to email you in 6 months' time to see if you are still applying any aspects of the training and / or deriving any benefits?

- ☐ Yes
- ☐ No
- ☐ Other (please specify):

32. This is the end of the study. It is hoped the research may lead to the development of a more permanent stress management resource for staff.

In the meantime if any participants would like to keep up their Daily Focus sessions just for their own benefit, we can set up a replica version of the webpages if enough participants are interested.

Would this be of interest to you?

- ☐ Yes
- ☐ No
- ☐ Other (please specify):

Continue >

Final Questionnaire Part 2



Page 10 of 10

End of Final Questionnaire

Thank you for completing this final questionnaire and for your overall contribution to this research study.


We hope you have found it interesting and helpful.

We will email you a report of the key findings when all the analyses have been completed. This should be towards the end of this year.

Thank you again for your help.

Appendix D11: Study 2: Twelve-month follow-up questionnaire (Time 5)

Daily focus skills training follow-up

UNIVERSITY OF
BATH

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Welcome to the follow-up questionnaire

There are **10 sections of questions**, followed by the **report of the study findings**.

Sections **1 to 9** are simple multi-choice questions similar to those you answered last year. **Section 10** offers you the chance to give your feedback regarding any possible long term influences of the training.

The questions should take about **15 to 20 minutes** to complete.

You are welcome to copy and save the subsequent report if you wish.

Continue >

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Please remember that once you have clicked on the **CONTINUE** button at the bottom of each page you can not return to review or amend that page

Login

1. Please enter the **participant ID number** you were given.

More Info

2. Please enter **today's date**. (Just click on 'Today' at the bottom of the calendar box. The box appears when you click in the answer space below).

(DD-MM-YYYY)

3. Please enter roughly what **time** it is now (e.g 10am, 9.15pm etc)

Continue >

This was followed by the scales below in the order shown:

PNES – 12; PSS – 10; HADS – 14; GOSS – 6; HINT – 12; W-BNS – 18; GSE – 10;
LOT-R – 10.

Section 10

Final questions before report

76. Do you think the training last year was useful or helpful to you AT THAT TIME?

- ☐ I don't think the training was useful / helpful to me
- ☐ I am unsure whether the training was useful / helpful to me
- ☐ I think the training was moderately useful / helpful to me
- ☐ I think the training was definitely useful / helpful to me
- ☐ Other (please specify):

77. If useful, which aspects of the training were most helpful and how? (If the training was not useful, please type 'n/a').

Reminder of key aspects of the training:

- **Impulsive/rational/habitual self** - understanding different influences on your thinking and behaviour
- **Strategic intelligence** - clarifying long term goals for improving your situation
- **Perceptual intelligence** - achieving more balanced assessments of your feelings and options for action
- **Tactical intelligence** - making better progress towards your goals through clearer prioritising; better timing of your efforts; rebalancing demands/resources; thinking smarter, more creatively; adding little extras for long term goals; shaping your environment to help you
- **Other?**

78. Which one of the following statements do you think most applies to you NOW?

- ☐ The training has not had any lasting influence on how I think about or respond to sources of stress.
- ☐ I'm unsure whether the training has had any lasting influence on how I think about or respond to sources of stress.
- ☐ The training has had a slight / moderate lasting influence on how I think about or respond to sources of stress.
- ☐ The training has had a considerable / significant lasting influence on how I think about or respond to sources of stress.
- ☐ Other (please specify):

79. If you now think or do anything differently to cope with stress compared to your approach before participating in last year's study, please briefly describe what this is. *If not, please type 'n/a'.*

80. How would you currently rate yourself in terms of your skills and effectiveness in reducing or managing sources of stress?

- ☐ Very poor
 ☐ Moderately poor
 ☐ Slightly poor
 ☐ Slightly good
 ☐ Moderately good
 ☐ Very good

81. If you think there is room for improvement in how you address or respond to sources of stress, in what way(s) do you think you could perhaps improve? *(If no suggestions, please type 'n/a').*

82. If you found the techniques helpful last year but haven't maintained your Daily Focus sessions, can you give any reasons for not continuing with them? *(If not relevant, please type 'n/a'.)*

83. In general, how would you currently describe your physical health?

- ☐ Excellent
☐ Very good
☐ Good
☐ Fair
☐ Poor
☐ Bad
☐ Other (please specify):

84. How much flexibility / choice do you have in the timing, order or way in which you carry out your work tasks?

- ☐ I have a large amount of flexibility/choice.
- ☐ I have a moderate amount of flexibility/choice.
- ☐ I have a slight amount of flexibility/choice.
- ☐ I have no flexibility/choice.
- ☐ Other (*please specify*):

85. Is there anything at present significantly affecting your stress levels? Or has there been any change in your circumstances that may have altered your stress levels or general well-being since participating in the study last year? If yes to either question, please explain briefly. (*If no, please type 'none'*)

Continue >

REPORT OF STUDY FINDINGS

1. INTRODUCTION

This report summarises the key findings of the Daily Focus skills training study conducted in 2012. It is provided as feedback for those who kindly volunteered.

2. BACKGROUND

How we think about and respond to sources of stress plays a key role in determining their ultimate impact on our well-being. Insights from psychological research can help us cope more effectively with stress. Face to face training programmes have been shown to be successful in developing coping skills. However they tend to be expensive to run and so relatively few people can benefit. The present research therefore is part of an effort to develop more cost effective ways of developing coping skills.

3. STUDY AIMS

The aim of the present research study was to test whether an online training programme could improve people's well-being through developing such skills. Specific aims were to:

- Recruit 25 female and 25 male participants working in office based administrative or technical roles.
- Guide them through a 6 week training programme developing problem solving and planning skills - featuring 3 types of intelligence: strategic, perceptual and tactical.
- Identify factors helping predict those most and least likely to benefit from such training.
- Track the time course and nature of any perceived changes in well-being (with assessments after 1, 3 and 6 weeks).

If you would like to keep a copy of these findings, you can copy and paste this and the subsequent pages.

Continue >

4. RESULTS

Participants

Thirty-three participants volunteered for the study: 28 women and 5 men. Their ages ranged from 24 to 62. Average age was 42. All were office based staff either at the University of Bath or the Open University. As there was an insufficient number of male volunteers, it was not possible to draw conclusions about any gender differences in relation to stress or coping activities.

Predictors of engagement/successful use of the techniques

Of the 33 participants who started 24 completed all stages of the study. Of these 24, 19 (16 women; 3 men) regularly practised the daily writing techniques. Among the possible motivating factors influencing participants' engagement with the training activities the strongest predictors were:

- Initial (negative) ratings of progress towards work goals
- Initial levels of negative emotion

Thus participants who reported higher levels of negative emotion and lower levels of satisfaction with their work situation tended to put more effort into the training.

Changes in self report measures of well-being over time

For the 19 participants who regularly practised the writing activities, the results were very encouraging. After just a week's practice there were improvements in virtually all the measures of well-being. Most changes were either statistically significant or close to this. *(NB If a change is calculated as being 'statistically significant' this means it is considered likely to be a genuine effect i.e. not just due to chance.)* The following changes were statistically significant:

- Reduced anxiety
- Improved progress towards work related goals
- Improved progress regarding emotional well-being
- Increased self-efficacy (a measure of perceived ability to perform tasks and achieve goals)

The following changes reported were more borderline in terms of statistical significance, but still likely to be genuine effects rather than due to chance.

- Reduced perceptions or feelings of stress
- Reduced negative emotions
- Reduced symptoms of depression
- Improved progress towards social life goals

Most of the reported improvements in these various measures of well-being were further enhanced when assessed again at three and six weeks. At six weeks participants also reported statistically significant improvements in feelings of competence in their jobs and better relationships with colleagues. For the 5 participants who completed the study but didn't practise the techniques regularly, there were no significant changes in any measures of well-being.

For those who regularly practised the techniques, specific benefits mentioned included:

- Understanding my own behaviour and feelings better.
- Realising I can think and act differently
- Being more realistic and clearer about my goals and how to achieve them
- Feeling calmer, more in control
- Feeling more confident and satisfied in how I handle difficult tasks and situations
- Appreciating my family and friends more
- Improving work relationships

At the end of the study participants were offered the option of continuing their Daily Focus sessions on a replica webpage. Of the 24 who completed the final questionnaire, 14 indicated they would be interested in using this. However only 6 participants subsequently did. Usage ranged from one to 20 further sessions.

Continue >

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5. CONCLUSIONS

The study showed that regular Daily Focus sessions applying problem solving and planning techniques resulted in significant improvements in a range of measures of well-being. These improvements appeared within a week and were further enhanced over the course of the study with Daily Focus sessions of just 10 minutes a day.

The findings suggest it is possible for people to improve their mental well-being using a simple online training activity without any expensive third party involvement (e.g. face to face advice from experts). This type of online resource therefore could possibly help organisations better support their staff in stressful situations. However the fact that around 40 percent of participants failed to complete the training suggests this approach may not be appropriate for everyone. One possible explanation is that some of these participants may not have found the issues addressed or solutions suggested particularly relevant to their situation. However given the study focus on alleviating work stress, it was encouraging that the strongest engagement was from those reporting the most negative feelings about work related issues. Thus the training appears to have been taken up and successfully used by those with strongest desire to improve their work situation.

Despite the positive results for those who engaged with the training, only about a third subsequently continued with their online Daily Focus sessions and generally not for very long. A question that naturally arises is whether participants have been able to maintain last year's improvements without the online activities e.g. by perhaps incorporating aspects of the techniques into their daily routines. Alternatively it may be that the benefits have faded without proper practice. The questionnaire you have just completed will hopefully provide some insights into this.

Given the benefits demonstrated by the study, if you would like to try using the Daily Focus sessions again, the link is still available:

<https://www.survey.bath.ac.uk/continued-dailyfocus-1>

We are very grateful to everyone who participated in the study and hope you have gained some useful insights into coping with stress. If you have any questions or comments about the study findings, you are welcome to add them below.

Thank you.

Questions / Comments

86. Any questions or comments about the findings of the study? *(Optional)*

Continue >

Daily focus skills training follow-up



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End of follow-up questionnaire and report

Thank you very much for completing this follow-up questionnaire.

We hope you found the report interesting.

Thank you again for all your help.

Appendix D12: Study 2: Cronbach's α scores for scale measures

Measure – Items	Time 1	Time 2	Time 3	Time 4	Time 5
PNES - Positive affect – 6	.86	.87	.85	.91	.92
PNES - Negative affect – 6	.81	.89	.92	.83	.91
PSS – 10	.88	.87	.94	.91	.87
HADS - Anxiety – 7	.79	.75	.84	.86	.92
HADS - Depression – 7	.80	.75	.84	.70	.75
Total GOSS – 6	.77	.82	.81	.87	.85
HINT – 12	.94	-	-	.90	.89
W-BNS - Autonomy – 6	.67	-	-	.76	.82
W-BNS - Competence – 6	.90	-	-	.92	.93
W-BNS - Relatedness – 6	.86	-	-	.88	.88
GSE - Self-efficacy – 10	.85	.83	.85	.90	.87
LOT-R - Optimism – 10	.90	-	-	.87	.90
TIPI - Agreeableness – 2	.53	-	-	-	-
TIPI - Conscientiousness – 2	.70	-	-	-	-
TIPI - Emotional stability – 2	.44	-	-	-	-
TIPI - Extraversion – 2	.75	-	-	-	-
TIPI - Openness to experience – 2	.78	-	-	-	-
REI-Type 1 – 5	.86	-	-	-	-
REI-Type 2 – 5	.76	-	-	-	-
CFC – 12	.89	-	-	-	-
ISEL - Appraisal support – 4	.48	-	-	.85	-
ISEL - Belonging – 4	.75	-	-	.71	-
ISEL - Tangible support – 4	.76	-	-	.75	-

PNES = Positive and Negative Emotional Style; PSS = Perceived Stress Scale; HADS = Hospital Anxiety and Depression Scale; GOSS = Goal Oriented Subjective Status; HINT = Habit Index of Negative Thinking; W-BNS = Work-related Basic Need Satisfaction; GSE = Generalized Self-Efficacy; LOT-R = Revised Life Orientation Test; TIPI = Ten Item Personality Inventory; REI = Rational Experiential Inventory; CFC = Consideration of Future Consequences; ISEL = Interpersonal Support Evaluation list.

Appendix E1: Study 3: Participate in projects advert

Testing new techniques to improve physical and mental well-being

We are conducting a study to explore potential health benefits of different approaches to coping with stress. Specific aims of the study are to:

- Test the effectiveness of two different types of mind training.
- Objectively assess any changes in participants' well-being resulting from the training.
- Identify whether different types of mind training are suited to different personality types.

Both training programmes have been specifically designed for busy office staff in that they:

- Require minimal time and effort (approximately 10 minutes a day)
- Involve no travelling or time away from work or home.
- Can be easily accessed online whenever convenient

Who can take part?

We are seeking to recruit men and women aged between 18 and 65 who work full or part-time in office-based administrative roles. The main mental well-being part of the study is open to all administrative staff. An additional option testing the effects of the training on levels of the stress hormone cortisol is open to full-time staff not taking medications that affect cortisol.

What is involved and how long will it take?

The study simply involves practising a series of brief online thinking and noting techniques, roughly 10 minutes a day for a week and a half. Effects on participants' mental well-being will be assessed via an online questionnaire completed before and after the training. The optional cortisol assessment involves participants collecting some saliva samples before and after the training.

Is it confidential?

Yes. Your participation and any information you provide will be kept strictly confidential. Online data collected will be anonymised and identified by code number only. The study has received full ethical approval from the University of Bath Psychology Ethics Committee (Ref: 12-175).

How to take part?

For more detailed information about the study please see the [Participant Information Sheet](#)

To participate in the study, please complete and return the [Consent form](#)

We will then contact you about your choice of option (i.e. main or plus cortisol). If you would like to know more or have further questions, please contact Steven Dean: S.Dean@bath.ac.uk

Appendix E2: Study 3: Participant information sheet



Participant Information Sheet

Project title: Testing new techniques to improve physical and mental well-being

You are being invited to participate in a research study. Before you decide whether you would like to take part, it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully. Ask us if there is anything that is not clear or if you would like more information.

❖ What is the purpose of the study?

The purpose of the study is to test the effectiveness of two different approaches to coping with stress and to identify which techniques work best for which people. The study also addresses the extent to which significant improvements in well-being can be achieved with minimal effort (e.g. just 10 minutes a day).

❖ Who can take part?

For the main study, we are seeking to recruit men and women (aged 18 – 65) with busy working lives, interested in learning how to cope more effectively with stress. They should work full or part-time in office based administrative roles.

An optional additional element of the study for full-time staff will be to assess the effectiveness of the training in reducing levels of cortisol, a stress hormone that can be measured in saliva. Cortisol levels can however be affected by a range of medications including: psychoactive medicines, opioid analgesic painkillers, antihistamines, anti-inflammatories and steroidal medications (e.g. in creams for skin conditions). Thus anyone regularly taking such medications will not be eligible for the cortisol element of the study.

❖ What does the study involve?

The study involves practising a series of online writing / noting activities approximately 10 minutes a day, for a week and a half. Any changes resulting from the training will be measured by comparing before and after questionnaires. The optional cortisol element will be similarly assessed by comparing levels before and after the training. The time required to complete the study adds up to approximately an hour a week for 3 weeks, as indicated in the table below. Participants will not need to report anywhere. The training is provided online and can be accessed when and wherever convenient via links emailed to you.

Week 1	Optional saliva (S) sampling	Activities (A = Activity)	Time required (minutes)
Tuesday	S 1		
Wednesday	S 2		
Thursday		Questionnaire 1	20
Friday		Guidance notes	30
Week 2			
Monday		A 1	10
Tuesday		A 2	10
Wednesday		A 3	10
Thursday		A 4	10
Friday		A 5	10
Week 3			
Monday		A 6	10
Tuesday	S 3	A 7	10
Wednesday	S 4	A 8	10
Thursday		Questionnaire 2	20



More details are provided below.

❖ **Training activities**

The study will compare the effects of two different approaches to coping with stress. Volunteers will be randomly assigned to one of the two types of training. Both sets of training consist of a set of explanatory notes followed by 8 daily thinking / noting sessions of approximately 10 minutes each, spread over a week and a half.

❖ **Questionnaires**

The first online questionnaire contains standard demographic and health related questions plus a series of scales addressing various aspects of well-being and ways of dealing with stress. The follow-up questionnaire will measure any perceived changes and provide participants with the opportunity to give their views on the techniques they have used.

❖ **Optional saliva sampling**

Levels of the stress hormone cortisol vary across the day. To get a representative average measure, participants will be asked to collect 3 saliva samples (2 morning and 1 evening) on two consecutive working days, before and after the training (12 samples in total). The sampling procedure simply involves chewing on a cotton swab for two minutes, then placing the swab in a test tube provided. Arrangements will be made for test kit collection and sample return at convenient central locations.

❖ **Are there any risks or disadvantages of taking part in the study?**

There are no identified risks or disadvantages of taking part in this study. The writing activities are enhanced versions of coping techniques commonly used in everyday life. Participants should hopefully gain a better understanding of the ways in which different techniques can contribute to their well-being and discover which techniques might suit them best. At the end of the study, participants will receive a report of the results highlighting lessons learnt on how to better cope with stress.

❖ **Will my taking part in this study be kept confidential?**

Any information you provide will be kept strictly confidential. Participant information provided in the questionnaires and written comments in the online activities will be anonymised i.e. identified by code number only. The data will be stored on a password protected computer at the University of Bath and only accessed by the PhD research student conducting the study. Any contact details that you choose to provide for communicating about the research will be stored separately from the data collected. This will be held on a separate University of Bath server, access to which will also be password protected. No one, other than the two Bath University researchers involved in the project, will see or have access to your details. To further enhance the anonymity of the data, it is suggested that participants use made up names or initials if they refer to particular people or issues in any of their online writing activities. Participants' notes only need make sense to them. The research interest is not in individual details, but in the overall frequency and amount of use of the different techniques and how this relates to well-being. It can sometimes be helpful to use anonymised quotes in reports, publications, verbal presentations or teaching materials to illustrate particular themes or issues. In this study however participants' written comments will only be considered for use in this way if participants expressly agree. Participants will be given this clear choice at the end of the study in the final questionnaire.

❖ **What will happen to the results of the research?**

Once the study is completed, you will be emailed a report summarising the results and any key lessons learnt. The findings may also be presented at conferences or published in an academic journal. Some of this research will also be written up for a PhD thesis within the University of Bath. You will not be identified in any reports or publications of the research.

❖ **Who is organising the research?**

The study will be conducted by Mr Steven Dean (PhD research student) under the supervision of Dr Julie Turner-Cobb at the University of Bath. The study has been approved by the Research Ethics Committee in the Department of Psychology at the University of Bath and adheres to British Psychological Society (BPS) guidelines for ethical practice in psychological research.

❖ **Contact for further information or assistance**

For further information or assistance concerning the study please contact Steven Dean by email: S.Dean@bath.ac.uk. As the training is self-administered, participants need only address topics or issues they feel comfortable with. If however you become concerned about any health or well-being issue that might arise during the course of the study then please contact your GP. Your employer may also be able to offer access to further useful information or support.

Thank you for reading this information



Appendix E3: Study 3: Participant consent form



Study Number: 12-175

CONSENT FORM

Project title: Testing new techniques to improve physical and mental well-being

Name of researchers:

Dr Julie Turner-Cobb (Supervisor), University of Bath

Mr Steven Dean (PhD Research Student), University of Bath

Please
confirm by
typing 'Yes'
in 3 boxes
below

1. I confirm I have read and understand the Participant Information Sheet (version 21.11.12) for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily.
2. I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason.
3. I agree to take part in the above study.

Please type in your name and date below:

Name of Participant:

Date:

Name of Researcher:

Date:

To confirm your consent, please type 'Yes' in the 3 boxes, type in your name / date and email to: S.Dean@bath.ac.uk

A completed copy will be returned to you.

Thank you

Version 21.11.12

Appendix E4: Study 3: Research study options form

Page 1 of 2

Research study options form – BCC participants

[This form will be stored electronically on a password protected Bath University computer, separate from the anonymised project data.]

1. Full name:

2. Gender:

3. Year of birth:

4. Preferred email address for communications about this study:

5. Do you work full or part-time?

If part-time, which days are you at your work office?

Will you be able to access the online training for 10 minutes each day as scheduled i.e. including week days when you are not at work?

6. Which work building are you based in?

7. Which department do you work in?

8. Please indicate below any training periods you would be available to participate.

You will only need to complete one training period for the study

We will try to place you in one of the earlier periods you're available, unless you prefer otherwise.

Training period	Start Date	End Date	Available (Yes/No)
1	Tuesday 12 February	Thursday 28 February	
2	Tuesday 19 February	Thursday 7 March	
3	Tuesday 26 February	Thursday 14 March	
4	Tuesday 5 March	Thursday 21 March	

If you would like to participate in just the main study (without cortisol assessment) please now email this form to: S.Dean@bath.ac.uk

If you think you might be eligible and would also like to participate in the cortisol assessment, please answer the additional questions on the next page.



ADDITIONAL CORTISOL OPTION

This option is open to staff:

- Working full-time Mondays to Fridays.
- Able to collect sample kit from and return samples to one of the "Collection Points" below.
- Not taking medications affecting cortisol levels – which the research team can advise on.

QUESTIONS

1. Do you work full-time Monday to Fridays?

2. Do you do most of your work between 8 am and 8 pm?

3. Please indicate which of the following collection points would be most convenient for you:

Collection Points	Contact	Yes / No
City Hall (Council House), Room 201, Health Improvement Team	Bryony Preston	
Brunel House, Floor 4, Sport and Health Development	Michaela Mulcahy	
Amelia Court, Floor 3, Strategic Housing	Lin Bryant	
Parkview, Floor 2, STS HR	Rob Butler	

4. Do you currently smoke?

If yes, you will still be eligible to participate provided you can avoid smoking for an hour before taking each sample.

5. Are you currently taking, about to take, or have taken any medications in the past 3 months?

Yes or No:

If yes, please list any medications and dosage / frequency below: (NB Women using oral contraceptives will still be eligible for inclusion in the study.)

Note: If you are unsure about your eligibility – just note the medication below and we can advise if compatible.

Medication name	Dose & frequency	(Condition treated if forgotten medication name)

6. Please indicate your mobile phone number:

[Note: This is for scheduling automatic SMS text messages to remind you when to take your saliva samples.]

Thank you for completing this form.
Please now email it to: S.Dean@bath.ac.uk



Appendix E5: Study 3: Instructions for collecting saliva



INSTRUCTIONS FOR COLLECTING SALIVA

Contents

1 Details of the saliva sampling kit 1

2 Correct timing of sample collection during the study 2

3 Procedure for collecting each sample 3

4 Storing and returning the samples..... 4

5 Reminder of study schedule showing sampling days..... 5

If you have any problems or questions, please contact
Steven Dean: S.Dean@bath.ac.uk

Thank you very much for your help and participation in this study



1 Details of the saliva sampling kit

You should have received a large brown envelope containing the following:

- These instructions for collecting saliva.
- A pen for completing 'sampling question sheets'
- 2 smaller brown envelopes (one for week 1, one for week 3) each containing:
 - 2 resealable plastic bags (one for Tuesday, one for Wednesday) each containing:
 - 1 sampling question sheet
 - 2 post-it notes
 - 3 plastic test-tubes each consisting of:
 1. Stopper
 2. Suspended insert or inner tube.
 3. Sterile swab (inside suspended inner tube)
 4. Base outer tube

Key points about the contents:

- Each of the 4 resealable plastic bags relates to one day's saliva collection.
 - Day 1 and 2 are for Week 1 **pre-training** sample collection.
 - Day 3 and 4 are for Week 3 **post-training** sample collection.
- Each sample tube has a label indicating :
 - Day (1, 2, 3 or 4)
 - The designated sampling time
 - Sample 1 - Awakening – Red dot on label.
 - Sample 2 – Waking + 30 mins – Yellow dot.
 - Sample 3 – Evening - 10pm – Green dot.
 - The ID number for each sample.
 - Date: *(which you will need to fill in when you take your sample)*
 - Exact time: *(which you will also need to fill in when you take your sample)*
- **Note:** The dot colours are based on a traffic light sequence i.e. **red** → **yellow** (i.e. amber) → **green** to help you remember to use them in the correct order.

If anything is missing from the above, please contact Steven Dean (S.Dean@bath.ac.uk)

2 Correct timing of sample collection during the study

Sample collection times

Using the appropriate kit for each sampling day (i.e. Days 1 to 4) you will need to collect 3 saliva samples:

- **Sample 1 - Awakening – (Red dot):** You need to take this as soon as you wake up, before you get out of bed and before doing anything such as eating, drinking, smoking or brushing your teeth.
- **Sample 2 – Waking + 30 minutes – (Yellow dot):** You need take this exactly 30 minutes after your awakening sample. You must not eat, drink (other than water), smoke or brush your teeth in the time between sample 1 and 2.
- **Sample 3 – Evening - 10pm – (Green dot):** You should take this as indicated at 10 pm.

In the two minutes it takes to collect each sample, you should complete the appropriate section of your sampling question sheet.

How to ensure you collect your samples at the right time

When pre-occupied with getting ready for work etc., it can be easy to forget to take a sample at the correct time. However if you follow the **6 simple steps** below, you should avoid such a problem:

1. The night before each sampling day, place the appropriate resealable plastic bag (containing 3 sample tubes and question sheet & 2 post-its) along with the pen next to your bed. Leave the Sample 1 (red dot) tube out of the bag ready for the next morning.
2. When you wake up, immediately take your first sample. Fill in the date and time on the label on the sample tube and fill in the appropriate section of the question sheet.
3. Add 30 minutes to your 'awakening sample' time (e.g. 7.22 + 30 = 7.52 for sample 2) and write this on a post-it note. Then when you get up, place the post-it note somewhere prominent (i.e. where you are likely to be in 30 minutes time e.g. bathroom, kitchen) to remind you to take sample 2. Also place the resealable plastic bag with sample 2 (yellow dot) tube, somewhere prominent e.g. kitchen table.
4. As you must not eat, drink (other than water), smoke or brush your teeth for an hour before sampling, plan how you are going to do this. Most people use the 30 minutes between samples 1 and 2 to wash, shower, dress, get work things together etc., then after sample 2 have breakfast etc. (Note: if you don't manage to get the timing exactly right, it is important when filling in the question sheet to note the actual time you took the sample.)
5. In the evening, from 9 pm please remember to avoid eating, drinking or smoking until having taken your 10 pm sample. Again have the sample 3 (green dot) tube out of the bag ready. When filling in the question sheet, remember to note if you took medications or if there were any problems or errors with the sampling for that day.
6. On each Tuesday night, remember to prepare for the next day's sampling. On each Wednesday night, place a reminder (e.g. post-it) somewhere appropriate to remember to take your samples to work Thursday morning.

Extra reminders:

If you live with others, ask them to help you remember to take each sample at the correct time.

You will also be sent a text reminder on the Monday, Tuesday and Wednesday evening of each sampling week.

3 Procedure for collecting each sample

Step 1

Ensure you are using the appropriate resealable plastic bag (i.e. Day 1, 2, 3 or 4) and the appropriate test-tube for the time of day (i.e. awakening → waking + 30 mins → evening 10 pm).

Step 2

Hold the tube at the rim of the suspended insert and remove the stopper by gently pulling. Removal of the stopper is easier if you slightly push it to the side when opening the suspended insert. You should avoid touching the swab with your hands. You can tip it into the base of the stopper and then use this to transfer it into your mouth.

Step 3

Gently chew on the swab moving it around the base of your mouth soaking up saliva e.g. under your tongue, between your cheek and lower teeth etc. Please ensure the swab is thoroughly saturated before removing it from your mouth. An indication that it is saturated is when you feel you can no longer avoid swallowing the saliva produced. This should normally take about 2 minutes. Also to retain as much saliva as possible in the swab, try to avoid biting down on it or sucking on it just before removing it from your mouth.

Step 4

While the swab is in your mouth, please complete the relevant section of the sampling question sheet i.e. noting the actual collection time and your general mood. After the 3rd sample please answer the last 3 questions about expected bedtime, any medications taken or anything unusual about the day's sampling.

Step 5

When the swab is thoroughly saturated, return it to the small suspended inner tube it was originally in (**not the larger outer tube / base – see pictures on page 4**). Try to avoid using your hands as this could contaminate the swab. Place the stopper **securely** back into the inner tube. Then ensure the inner tube is securely inserted into the outer tube / base.

Step 6

Place the test-tube back into the resealable plastic bag and store it in your refrigerator (**not the freezer**). If there is a problem with your refrigerator, please store the samples somewhere relatively cool, i.e. away from any source of heat.

Extra tips for reliable cortisol assessment

- Please try to keep to **the same routine for each of the 4 sampling days** e.g. getting up, going to bed at your normal times and not doing something different on one of the days e.g. a late night social event.
- Also on sampling days 3 and 4 (i.e. Tuesday and Wednesday of week 3), please try to do your Daily writing session at roughly the same time each day.
- For **an hour** before taking each sample please remember to avoid:
 - Brushing your teeth
 - Eating or drinking anything (other than water)
 - Smoking
- While collecting the samples, you should **avoid coughing or clearing your throat**. Also don't drink any water immediately before. Your sample should only contain saliva.

4 Storing and returning the samples

1. Please ensure all the stoppers are firmly in place. Each swab should be inside the smaller inner tube and not the larger outer tube as illustrated in the two pictures below:



2. When you have completed the three samples for each day, flatten the resealable bag around the samples to expel the air. Then ensure the seal at the top of the bag is securely closed.

3. You should ideally store your samples overnight in a refrigerator (not a freezer). At the very least, you should ensure you store them away from any source of heat (e.g. radiator or on a window ledge in sunlight).

4. On the Thursday morning of each collection week, please ensure you take your samples to work with you and hand over to the person at the relevant collection point, shown below:

Collection Points	Contact
City Hall (Council House), Room 201, Health Improvement Team	Bryony Preston
Brunel House, Floor 4, Sport and Health Development	Michaela Mulcahy
Amelia Court, Floor 3, Strategic Housing	Lin Bryant
Parkview, Floor 2, STS HR	Rob Butler

From there they will then be collected by a Bath University researcher for later analysis.



5 Reminder of study schedule showing sampling days

Week 1	Optional saliva sampling	Activities (A = Activity)	Time required (minutes)
Tuesday	<i>Sampling day 1</i>		
Wednesday	<i>Sampling day 2</i>		
Thursday		Questionnaire 1	20
Friday		Guidance notes	30
Week 2			
Monday		A 1	10
Tuesday		A 2	10
Wednesday		A 3	10
Thursday		A 4	10
Friday		A 5	10
Week 3			
Monday		A 6	10
Tuesday	<i>Sampling day 3</i>	A 7	10
Wednesday	<i>Sampling day 4</i>	A 8	10
Thursday		Questionnaire 2	20



Appendix E6: Study 3: Cortisol sampling question sheet

CORTISOL SAMPLING QUESTION SHEET

PRE-TRAINING – DAY 1

Please report the **precise times** you collected your saliva samples today.

Today's date: (Tuesday) _____ Participant ID # _____

Sample 1 (Red)						
Designated collection time		Waking time today which was:- [] ?				
Actual sample collection time		[] ?				
Generally how were you feeling at the time you collected the sample?						
Extremely negative	Quite a lot negative	Slightly negative	Neutral	Slightly positive	Quite a lot positive	Extremely positive

Sample 2 (Yellow)						
Designated collection time		Waking + 30 minutes which was:- [] ?				
Actual sample collection time		[] ?				
Generally how were you feeling at the time you collected the sample?						
Extremely negative	Quite a lot negative	Slightly negative	Neutral	Slightly positive	Quite a lot positive	Extremely positive

Sample 3 (Green)						
Designated collection time		10 pm				
Actual sample collection time		[] ?				
Generally how were you feeling at the time you collected the sample?						
Extremely negative	Quite a lot negative	Slightly negative	Neutral	Slightly positive	Quite a lot positive	Extremely positive

Time you expect to go to bed tonight →	[] ?	Please indicate (next day) if actual bedtime was different →	[] ?
--	-------	--	-------

KEY QUESTIONS

1. If you took any medications today – please give the name(s) and dosage(s):

.....

2. If there was anything unusual about your routine or activity levels today (e.g. evening social event) or you encountered any problems when collecting samples (e.g. unsure of waking time; missed a sample; used wrong test tube, ate/drank/smoked less than hour before collecting a sample etc.,) please explain:

.....

.....(Continue over page if needed)



KEY STEPS TO REMEMBER EACH DAY

1. Night before – place sampling kit by your bed with the correct Sample 1 (Red dot) tube ready for when you wake up.
2. Morning – as soon as you wake up, take Sample 1. Note the exact time on test tube and question sheet. Also answer mood/feeling question.
3. Add 30 minutes to your waking time. Write this time on post-it note. Place post-it somewhere prominent. Have Sample 2 (Yellow dot) tube ready.
4. Do not eat, drink (other than water), smoke or clean teeth until you have also collected Sample 2. Note sampling time on tube and sheet as before.
5. Evening – from 9 pm – avoid eating, drinking (other than water), smoking or cleaning your teeth until you have collected your 10 pm saliva sample. Note time on tube and question sheet as before. Complete question sheet.
6. Prepare for the next day – i.e. place sampling kit by bed for Wednesday morning waking sample.




Appendix E7: Study 3: Content and timing of SMS text messages

Day	Time	Message
Monday	21:00	Please remember to place waking sample tube (red dot) + question sheet + pen by your bed for your waking sample tomorrow. Also plan your waking + 30 min sample.
Tuesday	21:00	Please remember to take your 10 pm sample (green dot) & fill in question sheet. Also place waking sample tube etc by bed for tomorrow & plan waking + 30 sample.
Wednesday	21:00	Please remember to take your 10 pm sample (green dot) & fill in question sheet. Also prepare reminder to ensure you take this week's samples to work tomorrow.

N.B. SMS text message length was limited to 160 characters.

Appendix E8: Study 3: Questionnaire 1 (Time 1)

Questionnaire 1

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Page 1 of 18

Welcome to the study

Thank you for volunteering to take part in this study. We hope you find it interesting and helpful.

There are **2 questionnaires**, this one before the training and a similar one after the training. Please try to complete them at **similar times of day** (e.g. both in the morning, afternoon etc.).

There are **15 sections** to this questionnaire. It usually takes around **20 to 30 minutes** to complete. Just proceed at whatever pace is comfortable for you.

All answers will be kept **strictly confidential**.

Please note that once you have clicked on the CONTINUE button at the bottom of each page you can not return to review or amend that page

Continue >

Page 2 of 18

About the questionnaire

The questions in this survey address a wide range of factors which can be associated with **stress**. We would be grateful therefore if you could answer **all** questions.

However if none of the answers are appropriate, or if you prefer not to answer for any reason, many questions have a 'n/a' (not applicable) option. Similarly you can write 'n/a' in any of the comments boxes if you prefer not to answer.

Please remember that once you have clicked on the CONTINUE button at the bottom of each page you can not return to review or amend that page

Section 1 - General demographic and work related questions

1. Please enter the **participant ID number** you were given.

More Info

2. Please enter **today's date**. (Just click on 'Today' at the bottom of the calendar box. The box appears when you click in the answer space below).

(DD-MM-YYYY)

3. Please enter roughly what **time** it is now (e.g 10am, 9.15pm etc)

4. What is your gender?

☐ Female

☐ Male

☐ Transgender

5. Please type in the **year** you were born.

6. How would you describe your ethnic origin? Please tick one.

- ☐ White British
- ☐ Any other white background
- ☐ Asian British
- ☐ Any other Asian background
- ☐ Black British
- ☐ Any other Black background
- ☐ Mixed British
- ☐ Any other mixed background
- ☐ Chinese British
- ☐ Any other Chinese background
- ☐ N/a
- ☐ Other (please specify):

7. What is your current marital status or same-sex civil partnership status? Please tick one.

- ☐ Currently married and living together, or living with someone in a registered same-sex civil partnership
- ☐ Single
- ☐ Separated / divorced / formerly in a registered same-sex civil partnership
- ☐ Widowed / surviving partner from a same-sex civil partnership
- ☐ N/a
- ☐ Other (please specify):

8. Do you live in a:

- ☐ House.....
- ☐ Flat.....
- ☐ Bedsit.....
- ☐ Hostel or Hall of Residence.....
- ☐ N/a
- ☐ Other (please specify):

9. How many people live in your home (including you)?

10. How many children do you have?

Select an answer

11. How many children under the age of 18 live in your home?

Select an answer

12. How many children of 18 or over live in your home?

Select an answer

13. What is the age of the youngest child living in your home, if any? (Please insert 'n/a' if none)

14. What is your highest level of educational qualification? Please tick one.

- ☐ None
- ☐ CSE's or equivalent
- ☐ GCSE's, O levels or equivalent
- ☐ A/AS levels or equivalent
- ☐ Degree (BA, BSc or equivalent)
- ☐ Postgraduate degree (MA, MSc, MPhil, PhD)
- ☐ n/a
- ☐ Other (please specify):

15. How many hours a week do you usually work at your place of work?

16. How many hours a week on average do you work at home? (Note: This refers to 'paid employment', not for example housework.)

17. How much flexibility / choice do you have in the timing, order or way in which you carry out your work tasks?

- ☐ I have a large amount of flexibility/choice.
- ☐ I have a moderate amount of flexibility/choice.
- ☐ I have a slight amount of flexibility/choice.
- ☐ I have no flexibility/choice.
- ☐ Other (please specify):

18. On what basis are you currently employed?

- ☐ Temporary staff
- ☐ Permanent staff
- ☐ Other (please specify):

19. If you work at Bristol City Council, what is your job grade? (Please select 'n/a' if not a Bristol City Council employee.)

Select an answer ▾

If you selected Other, please specify:

20. Do you manage or supervise other members of staff?

- ☐ Yes
- ☐ No
- ☐ Other (please specify):

21. If yes, approximately how many members of staff report to you, either directly or indirectly (i.e. through others)? Please insert 'n/a' if none.

22. Approximately how long have you been working in your present job role or function? (i.e. how long since the last major change in the location, nature, content or organisation of your work?)

23. Approximately how long is it since there was a major change in your routine / pattern of living outside work (e.g. change of where you live or who you live with, etc.)?

24. At work, how approachable / open minded / open to discussion of your ideas and suggestions, do you consider your line manager / supervisor?

- ☐ Very approachable / open to discussion
- ☐ Moderately approachable / open to discussion
- ☐ Not particularly approachable / open to discussion
- ☐ Difficult to approach / discuss things with
- ☐ N/a
- ☐ Other (please specify):

Continue >

Section 2 - Health and lifestyle related questions

25. In general, how would you say your **physical health** has been in the **PAST WEEK**?

- ☐ Excellent
- ☐ Very good
- ☐ Good
- ☐ Fair
- ☐ Poor
- ☐ Bad
- ☐ Other (please specify):

26. Do you smoke cigarettes regularly (i.e. on a daily basis)?

- ☐ yes, current smoker
- ☐ no, ex regular smoker
- ☐ no, never or hardly ever smoked
- ☐ Other (please specify):

27. If you are a current smoker, on average how many cigarettes do you smoke on a **week day**?

If you don't smoke, please enter *none*

28. Regarding drinking alcohol (e.g. beer, wine, spirits etc.) would you describe yourself as:

- ☐ a non-drinker
- ☐ a very occasional drinker (special occasion only)
- ☐ an occasional drinker
- ☐ a regular drinker
- ☐ Other (please specify):

29. On average how many days a week do you take some form of exercise?

Select an answer -

30. What type of exercise is this **AND** how long do you usually do it for on each occasion? (If none, please type n/a)

31. On a **working weekday**, what time do you usually **wake up** in the morning.

32. On a **working week day**, what time do you usually **go to sleep** at night?

33. Do you have trouble staying asleep throughout the night (including waking up too early)?

- ☐ Rarely
- ☐ Occasionally
- ☐ Often
- ☐ Most nights
- ☐ Other (please specify):

34. What is your height? (either in metres or in feet and inches)

35. What is your approximate weight? (either in kilos or stones/pounds)

36. Have you had any kind of stress management training before?

- ☐ No I haven't had any stress management training.
- ☐ I'm not sure.
- ☐ Yes, I have had stress management training.
- ☐ Other (please specify):

37. If you have had some form of stress management training, please briefly state what kind of training. (If none, please type n/a)

38. Do you or have you ever kept a regular diary (i.e. of events that have happened each day)?

- ☐ No, never
- ☐ Yes, but a long time ago
- ☐ Yes, relatively recently
- ☐ Yes, currently
- ☐ Other (please specify):

[Continue >](#)

This was followed by the scales below in the order shown:

PNES – 12; PSS – 10; HADS – 14; GOSS – 6; HINT – 12; W-BNS – 18; GSE – 10;
TIPI – 10; LOT-R – 10; COPE – 28; CFC – 12; ISEL – 12.

Section 15

Final questions

125. Has there been anything different or unusual about the past week or so that may have made your stress levels much higher or lower than usual? If yes, please explain briefly. (If no, please type 'none')

126. What do you currently do, if anything, to cope with or reduce your stress?

127. Before considering this training programme, had you given much thought to how you might reduce or better cope with stress in the future? If yes, what kind of things did you have in mind?

Continue >

Questionnaire 1



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End of Questionnaire 1

Thank you very much for completing the questionnaire.

You have been randomly allocated to the **Daily Focus** training programme.

The link to the **Guidance Notes** for this programme is given below:

<https://www.survey.bath.ac.uk/dailyfocusguidance>

.

PLEASE COPY AND SAVE THIS LINK SOMEWHERE NOW - SO THAT YOU CAN ACCESS THE NOTES WHENEVER YOU WANT

.

The next step is to read the Guidance Notes. This is scheduled for tomorrow i.e. **Friday**.

PLEASE DECIDE NOW when you will do this and note it somewhere appropriate so you remember.

.

You should then start your training activities **next Monday**. *(Again it will help you remember if you decide and note a specific time and place.)*

.

Good luck with the training. **Please don't discuss the training with any work colleagues.** They may also be taking part in the study and it is important to avoid influencing each other.

Thank you

Appendix E9: Study 3: Daily break training guidance notes

Training Guidance Notes - Daily Break



Page 1 of 9

Welcome to the Daily Break training programme

There are **7 sections** shown below. Please take your time and **read these notes carefully**. It should only take about **20 to 30 minutes**.

Section 1 - Login

Section 2 - Stress, its impact and solutions

Section 3 - Potential benefits of mental relaxation / positive mood generation

Section 4 - Interrupting negative thoughts and emotions

Section 5 - Creating positive thoughts and emotions

Section 6 - Key questions about the training programme

Section 7 - Confirmation of participation

Whenever you want to review any sections, you can log in again at a later date. You won't need to complete section 7 again. You can simply close the browser window when you reach that section again.

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Section 1 - Login

1. Please enter the **participant ID number** you were given

[More Info](#)

2. Please enter **today's date**. (Just click on 'Today' at the bottom of the calendar box. The box appears when you click in the answer space below).

 (DD-MM-YYYY)

3. Please enter the **time now** to the nearest minute (e.g 9.06 am, 4.38 pm etc)

[Continue >](#)

Section 2 - Stress, its impact and solutions

What is stress?

Stress is a widely used term and can mean different things to different people. A generally accepted definition is that stress is what we experience when the demands placed upon us (e.g. workload, duties, personal commitments to family and friends etc.) appear to exceed the resources available to meet those demands (e.g. time, money, energy, knowledge, skills etc.).

What is the impact of stress?

Situations in which we feel stressed tend to provoke two types of responses. Firstly negative thoughts and emotions e.g. panic, worry, anxiety, anger, frustration etc. And secondly physiological responses associated with the release of stress hormones such as adrenaline and cortisol, commonly referred to as the 'flight or fight' response.

In short bursts these reactions are not necessarily a problem and may even be beneficial. However if the stress persists over months and years, repeated triggering of stress hormones such as cortisol can contribute to a wide range of physical and mental health problems.

What is the solution to stress?

There are many different approaches to coping with stress and many types of stress related training on offer. Examples include: anger management, cognitive therapy, various kinds of exercise, guided imagery, hypnosis, meditation, neuro-linguistic programming, problem solving, progressive muscle relaxation, time management and many more.

With such a diverse range of techniques it is hard to know what to choose or where to start. The choice is made more difficult by the fact that there is relatively little evidence of what actually works, for whom or how. Many commercial training programmes offer a mixed bag of coping techniques with no before and after assessment to provide evidence of any benefits. And even with assessment, as such training involves a mixture of techniques, it would be difficult to pinpoint the source of any benefits.

This research study therefore focuses on assessing the benefits of one type of approach at a time. This offers the following advantages:

1. It is simpler and less confusing to learn and apply a single coping approach.
2. The approach can be applied in more depth to make better use of its potential.
3. Testing one approach at a time makes it easier to identify what works best and for which people.
4. This should hopefully lead to better guidance for individuals in choosing the most appropriate ways of coping with stress.

The present study is testing two different approaches. All participants have been randomly allocated to either of the two types of training. Your training involves **mental relaxation / positive mood generation**. It is explained in the next section.

Continue >

Section 3 - Potential benefits of mental relaxation / positive mood generation

How the training activities are designed to work

As mentioned in the previous section, stress induces negative thoughts and emotions which in turn trigger the release of stress hormones such as adrenaline and cortisol. The activities in this training are therefore designed to help you switch off from negative thoughts and emotions and replace them with more positive thoughts and emotions. The logic is that this should not only lift your mood, but it should also interrupt the triggering of stress hormones, allowing your body to return to a more balanced state. The optional saliva testing part of the study has been included to test this.

The more positive the mood created, the more it should counterbalance any negative emotions. So the training is not simply about helping you relax. It is also about generating positive emotions. It does this using an active form of relaxation based on creative writing. The logic for using writing is as follows:

1. An active form of relaxation (e.g. writing) should engage your brain more than a passive form (e.g. watching TV) and should therefore be more effective in interrupting any negative thoughts.
2. The more novel and original the ideas you can create, the more absorbing and entertaining they are likely to be.
3. The more positive the mood created, the more likely this is to counteract any negative mood.

Timing of the training activities

This training programme is designed for busy working people. The 'Daily Break' session, in which you practise the writing activities, has been limited to just ten minutes a day so it can fit easily into anyone's routine. However no matter how intense, the boost from ten minutes' positive mood generation is unlikely to last throughout the day. It is important therefore to time your Daily Break session for when you think it is likely to produce the most enduring benefits.

Three key options are suggested below, each with its own rationale for how it might help improve well-being:

- (i) When you are just winding down at the end of your working day i.e. the last thing you do before you go home. The reasoning here is that it should help you switch off from work, creating a clear division between work and home.
- (ii) When you are relaxed in the evening e.g. just arrived home / before dinner or TV or bed. Again the thinking here is that it should help you wind down in the evenings. Doing it just before bed for example might help some people relax and sleep better
- (iii) When you sit down at your work desk first thing in the morning, before you do anything else. The rationale for this timing is that it could help set a positive tone for the day (or at least a significant part of the day) by getting you off to a good start.

If there is another time you prefer however, then please choose that. You can also experiment, trying different times. Though we would suggest you aim to adopt a set pattern particularly by the second week, i.e. practising your Daily Break session at the same time each day. This will make it easier to identify any benefits associated with practising the activities at set times.

Structure of the training activities

Though the aim of the activities is to help you replace negative moods with more positive moods, this may not always be easy. If for example you have had a particularly frustrating day, you might find it difficult to switch directly to a calmer, more positive state, e.g. by trying to picture yourself on a beautiful beach. The training therefore has two stages to help overcome particularly negative moods. These are:

- **Stage 1** - Interrupting negative thoughts and emotions
- **Stage 2** - Creating positive thoughts and emotions

As not everyone finds the same things appealing, both stages have a wide range of activities to choose from. These are explained in the next two sections.

Continue >

Section 4 - Interrupting negative thoughts and emotions

Your Daily Challenge

The activities described in this section are designed to help you switch off from negative moods. If, when you start your Daily Break session, you are not experiencing any negative emotions, you can just go straight to the positive mood generation activities (described later).

When you are experiencing negative emotions, the parts of the brain that are activated tend to dampen down parts of the brain involved in positive emotions. This can make it difficult to switch from one mood to the other. The 'Daily Challenge' activities therefore serve as an intermediate step between the two. Their aim is to shift your attention away from any negative influences, by stimulating your curiosity and sense of challenge. For the activities to work therefore, you need to find a challenge that interests you.

There are three categories of activities. Each offers a slightly different kind of challenge, each associated with a different type of knowledge / brain function. The idea is that you test yourself in an area that appeals to you. The activities are:

Activity 1 - *Testing your memory of personal experiences / events*

This is based on episodic memory i.e. your memory of specific personal events and experiences. This should be open to everyone as no specialist knowledge or learning is required. The challenge you set yourself therefore is to try to remember specific details of past enjoyable experiences e.g. something that happened last month, last year etc. For example testing your memory of places you visited on holiday or the names of people you met.

Activity 2 - *Testing your knowledge / memory of facts and figures*

This is based on semantic memory i.e. general knowledge of facts and figures. We tend to know a lot more than we realise. So there should be no shortage of things to test ourselves on. Simple examples include trying to list country names, animals, foods etc., for every letter of the alphabet. The more you can tailor the challenge to your particular interests and strengths, the more enjoyable and effective it is likely to be.

Activity 3 - *Using your judgment / decision making*

This goes beyond testing memory and involves using your judgment. A typical challenge here might be deciding on your top five films of the past year, decade etc. You can also extend this by justifying your choices.

You can try all three types of activity or just focus on one. If you enjoy quizzes, puzzles, crosswords etc., you should find it quite easy to get into the activities. If not, it may take some practice. The key is to find topics that appeal to you.

Benefits of Daily Challenge activities

1. They should help you interrupt negative chains of thought by stimulating your curiosity and sense of challenge.
2. By interrupting negative thoughts, they should help provide a better platform for subsequent positive mood generation.
3. Also for anyone who finds these activities particularly enjoyable, they can serve as a form of positive mood generation in their own right.

Continue >

Section 5 - Creating positive thoughts and emotions

Your Daily Visualization

The purpose of these activities is to help you generate positive thoughts and emotions. The more positive the better. You may be familiar with certain visualization techniques, e.g. imagining yourself relaxing on a beach, as mentioned earlier. However as people differ in their interests and creativity, the training offers a wide choice of visualization topics and writing styles. This ranges from relatively straightforward descriptions to highly imaginative writing. The research study will try to identify which topics and styles of writing if any appear to be most effective.

There are 6 activities to choose from. They are outlined below:

Activity 1 - Continuing with a 'daily challenge' activity

This is for any participants who find the daily challenge activities more enjoyable and easier to sustain than the visualization activities. (Note: The key to the Daily Break sessions is to do something you enjoy.)

Activity 2 - Describing present visible objects or scenes

This should appeal to anyone who finds it easier to write about things they can directly see. This would typically involve describing / writing about something you really like e.g. a view from your window.

Activity 3 - Describing remembered objects or scenes

This activity relies on memory e.g. remembering and describing enjoyable past experiences e.g. holidays, childhood memories etc.

The remaining three activities rely on imagination and creativity. Some may find this easy, others more difficult. It is worth persevering however as these activities offer the most scope for positive mood generation.

Activity 4 - Describing an imagined situation in which you are a passive observer

This activity is good for creating soothing, relaxing feelings. This would tend to involve imagining yourself soaking up an atmosphere that really appeals to you (e.g. an idyllic tropical island, Parisian café etc.).

Activity 5 - Describing an imagined situation in which you are an active participant

This offers limitless scope for immersing yourself in weird and wonderful experiences e.g. from having dinner with Einstein to meeting a member of the royal family at your local supermarket.

Activity 6 - Describing an ongoing story involving a character other than you

If you want a complete break, this activity allows you to step outside yourself by creating your own fictional characters and situations. This is typical of what a novelist might do and if you enjoy creative writing this might be the option for you.

Whatever activity you choose, your aim should be to immerse yourself completely in an enjoyable experience for ten minutes or so. The quality of the writing is unimportant. The mood created is the key. If it brings a smile to your face, you should be on the right track. Once you have finished your writing session, your aim should be to try to carry forward your positive mood with you when resuming your normal activities.

Potential benefits of visualisation activities

If you are able to immerse yourself in the activities:

1. They should help you relax and generate a more positive mood.
2. They could help interrupt the triggering of stress hormones allowing your body to return to a more balanced state.
3. Though the effects of Daily Break activities may be temporary, if well timed, they could provide a valuable respite at a critical time of day.

Continue >

Section 6 - Key questions about the training programme

What basically do I need to do?

Daily Break sessions - 8 sessions - Monday to Friday next week / Monday to Wednesday the week after - 10 minutes per session

Starting from Monday, you should aim to take a 'Daily Break' of about ten minutes each day. The purpose of the break is to relax and replace any negative thoughts and feelings with more positive thoughts and feelings. Try to pick a set time each day when you feel the session is likely to be most beneficial.

Why is writing or noting things down important?

As mentioned earlier, writing is a more active form of relaxation / mood enhancement than for example watching TV. It should therefore be more effective in interrupting negative thoughts and emotions. If you just try to imagine situations in your head, it is easy to lose your train of thought. Writing things down however anchors your ideas more firmly and enables you to build on them.

What benefits can I expect from this training?

There are two key benefits. Firstly, the training will give you the opportunity to practise various forms of mental relaxation and positive mood generation to see if you find them helpful in managing stress.

Secondly the study should help clarify whether particular stress management techniques are more effective than others. It could also show whether specific techniques are suited to particular types of individual. The findings of the study will be reported back to you and should help guide you towards appropriate ways of coping with stress.

Continue >

Section 7 - Confirmation of participation

From the guidance notes you should now have a general idea of what the training involves. Your understanding will develop further as you practise the activities

Most participants quickly learn the techniques and complete the series of daily sessions with little or no difficulty.

We recognise however that this training may not appeal to everyone. Consequently if you feel it is not for you and don't want to try it for the next week and a half, please feel free to withdraw now.

Questions 4, 5, 6 and 7 should help you decide

4. Do you think you are stressed?

- ☐ I don't think I am stressed.
- ☐ I am unsure if I am stressed.
- ☐ I think I am stressed
- ☐ Other (please specify):

5. Do you want to take action now to address your stress?

- ☐ I have decided I don't want to take action now.
- ☐ I am unsure whether or not I want to take action now.
- ☐ I have decided I want to take action now.
- ☐ Other (please specify):

6. From what you have read about the present training programme, do you think it might be able to help you?

- ☐ I don't think this training can help me.
- ☐ I am unsure whether training can help me.
- ☐ I think this training can perhaps help me.
- ☐ I think this training can definitely help me.
- ☐ Other (please specify):

7. Have you had any previous training similar to the programme described here?

- ☐ No I haven't had any training similar to this.
- ☐ I am not sure if I have had training similar to this.
- ☐ Yes I have had training similar to this.
- ☐ Other (please specify):

Your decision

8. Would you like to proceed with the training programme?

- ☐ Yes, I confirm I would like to proceed with the training. (Note: If yes, please answer question 9 only.)
- ☐ No, I have decided to withdraw. (Note: If no, please answer questions 10, 11 and 12 only.)

**If you wish to proceed, please answer Question 9 and then continue to the last page.
(Please ignore 10, 11 and 12 which are for withdrawing.)**

9. At which **specific moment** each day do you plan to do your Daily Break sessions? (Note: It only takes about 10 minutes but **importantly it needs to be when you can make time to relax.**) Please see **More Info**. (Optional)

- When I'm just winding down at the end of my working day i.e. the last thing I do before I go home
- When I'm relaxed in the evening e.g. just arrived home / just before dinner or TV or bed
- When I sit down at my work desk first thing in the morning, before I do anything else
- Other (please specify):

If you are proceeding with the training, please now continue to the last page.

If you have chosen to withdraw, please answer Questions 10, 11 and 12.

Then simply continue to the last page, then close the tab/browser window and your decision to withdraw will have been noted.

10. If you choose to **withdraw**, you do not need to provide an explanation. You can just type 'n/a'. However if you are happy to do so, any comments explaining your decision would be much appreciated. This could help us improve the programme design or better tailor it to different interests. (Optional)

11. If you choose to **withdraw**, would you still like to receive (by email) a report of the eventual findings of the study? (Note: This will be available to all participants.) (Optional)

- Yes, I would like to receive a report of the study findings.
- No, I do not want to receive a report of the study findings.

12. If you choose to **withdraw**, would you be prepared to complete a short online questionnaire in two weeks time? (This will help us compare stress related measures for those who do the training and those who don't.) (Optional)

- Yes, I will complete the questionnaire.
- No, I would prefer not to complete the questionnaire.

Continue >

Training Guidance Notes - Daily Break



Page 9 of 9

End of "Training Guidance Notes"

Thank you for reading these notes.

If you are proceeding with the training, when you are ready to start your first Daily Break session, the link is:-

<https://www.survey.bath.ac.uk/mydailybreak>


PLEASE COPY AND PASTE THIS LINK SOMEWHERE - NOW - SO THAT YOU CAN REGULARLY ACCESS THE 'DAILY BREAK' WEBPAGES

Please note: Your **first Daily Break session** is scheduled for **next Monday**.

Thank you for completing this stage of the study.

If you are withdrawing, thank you for giving this your time and consideration.

Appendix E10: Study 3: My daily break sessions

My Daily Break

Welcome to your Daily Break session

This is your moment to **take a break from any stressful thoughts or problems.**

.

Section 1 - Login.

Section 2 - Interrupting negative thoughts and emotions:..... usually **1 ACTIVITY** per day.

Section 3 - Creating positive thoughts and emotions:..... usually **1 ACTIVITY** per day.

.

You will have the option of **PRINTING** your answers if you would like to retain a copy.

Please note that once you have clicked on the **CONTINUE** button at the bottom of each page you can not return to review or amend that page.

Continue >

Section 1 - Login

1. Please enter the **participant ID** number you were given.

More Info

2. Please enter **today's date**. (Just click on 'Today' at the bottom of the calendar box. The box appears when you click in the answer space below).

(DD-MM-YYYY)

3. Please enter the **time now** to the nearest minute (e.g 9.06 am, 4.38 pm etc)

The Daily Break routinely takes about 10 minutes a day

Initially it may take longer as you learn the activities. Later it may take less, particularly if you are already in a positive mood

Be guided by what feels appropriate

Continue >

Section 2 - Interrupting negative thoughts and emotions

Your Daily Challenge

Relax, take a deep breath and note how you are currently feeling. Tick the appropriate response for **question 4**. Then focus on whichever of **questions 5, 6 or 7** is most appealing.

Pick **just ONE** of the three.

Each offers a different way of asking yourself a challenging question. This should help interrupt any negative thoughts by stimulating your curiosity. This in turn should provide a better platform for creating a more positive mood with the activities in Section 3.

The basic activity for you to consider is shown in bold type. (HINTS for how to approach it are shown in brackets.)

Clicking on the **"More Info"** button to the right of each question will give you **examples of typical answers** to these types of questions, plus any **useful tips**.

You can write as much or as little as you like. The key is to **the absorb yourself in thinking about something different**.

4. Please indicate how you are feeling now, as you begin your Daily Break session.

	Extremely negative	Quite a bit negative	Slightly negative	Neutral	Slightly positive	Quite a bit positive	Extremely positive
a. Your main feeling / emotion now?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

5. Testing your memory of personal experiences / events.

[More Info](#)

(HINTS: Try to remember details of distant events e.g. places you visited on a holiday or the names of people you met, or teachers who taught you in primary or secondary school etc.)
(Optional)

6. Testing your knowledge / memory of facts and figures.[More Info](#)

(**HINTS:** Challenge yourself with a quick test of your knowledge e.g. trying to list country names, animals, foods etc for each letter of the alphabet. Or listing as many examples of particular categories as you can think of e.g. heads of state, makes of car etc.) (*Optional*)

7. Using your judgment / decision making[More Info](#)

(**HINTS:** Try ranking for example your top 5 or 10 items / people etc., for any particular category that interests you e.g. films, songs, TV programmes, holiday destinations, actors, singers, musicians, artists, politicians, historical figures etc. You can also extend this by adding your justification for your choices.) (*Optional*)

You should hopefully now feel slightly detached from any earlier, particularly negative, mood state.

The activities in the next section should help you progress further to a more intense, positive mood.

[Continue >](#)

MORE INFORMATION BOX CONTENTS – Question 5

EXAMPLE ANSWER

Secondary school teachers

English – Mrs Fotheringham

Maths – Mr Bonner

History – Mr Hart

Geography – Mr Copson

Etc.

TIPS

- Trying to remember something very distant transports your thinking to a different time and place (i.e. temporarily away from any present situation).
- As this activity is meant to be a first step towards creating positive emotions, it makes sense to avoid trying to remember things associated with negative past experiences. So if, for example, you didn't enjoy your school days, then this wouldn't be something to test your memory on.
- The aim should be to test your memory relating to positive experiences, e.g. enjoyable holidays, names of old friends and their siblings, where they lived, etc.

MORE INFORMATION BOX CONTENTS – Question 6

EXAMPLE ANSWER

Male singers by surname

Astley, Rick

Bowie, David

Costello, Elvis

D?

E?

Fury, Billy

G?

Humperdinck, Engelbert

Etc.

TIPS

- The possibilities are endless. There are countless categories you can consider and different ways of approaching them, e.g. listing by first names, second names, names that rhyme, etc.
- If you like history, for example, you can test yourself on sequences of monarchs or political leaders of different countries across the years. You can also try listing key events for each of the past ten, twenty years, etc.
- If you like geography, you could list any towns or countries you'd have to pass through, travelling from one location to another far away.

MORE INFORMATION BOX CONTENTS – Question 7

EXAMPLE ANSWER

My top five films in 2012:

1. Argo
2. End of Watch
3. Skyfall
4. Silver Linings Playbook
5. The Best Exotic Marigold Hotel

TIPS

- As with the previous activities, the list of potential topics or categories is endless.
- You can further extend this by considering sub-categories. So with films, for example, you can consider different genres, years, decades, etc.
- As with the previous activities, the more the category relates to something you enjoy, the better.

Section 3 - Creating positive thoughts and emotions

Your Daily Visualisation

The activities below are designed to **stretch your imagination** in different directions to help you find something absorbing that you can immerse yourself in as a break for 5 - 10 minutes.

They generally progress from straightforward description to more elaborate forms of imagination or visualisation. Choose whatever you feel most comfortable with.

Pick just ONE ACTIVITY.

If you're stuck for **ideas**, click on the relevant '**More Info**' box.

Please note this BOS survey platform is not normally used for long e.g. page length descriptive passages. So if you ever find yourself writing a large amount and want to keep your notes, it is suggested that you also copy and paste what you've written and back it up elsewhere.

8. Continuing with a previous 'daily challenge' activity

(**HINTS:** If you are enjoying a memory or judgement challenge from the previous section, and would feel happier continuing with that rather than switching to a visualisation activity, you can do so here.)
(Optional)

9. Describing present visible objects or scenes[More Info](#)

(**HINTS:** If you have a pleasant scene from your office window or home or wherever you are, you can describe this in general or by focusing on a particular feature. Alternatively if there is an interesting or attractive object in view, you can describe this and perhaps what you like about it.) (Optional)

10. Describing remembered objects or scenes[More Info](#)

(**HINTS:** Typical objects might include a work of art or something you think is beautiful or particularly well designed. Typical scenes might include impressive landscapes, buildings, places you enjoyed visiting on holiday. You can also include memorable events e.g. a sporting or historical incident or meeting someone famous.) *(Optional)*

11. Describing an imagined situation in which you are a passive observer[More Info](#)

(**HINTS:** This should be an enjoyable setting, somewhere that really appeals to you, that brings a smile to your face imagining yourself there, soaking up the atmosphere e.g. an idyllic tropical island, Parisian café etc.) *(Optional)*

12. Describing an imagined situation in which you are an active participant.[More Info](#)

(**HINTS:** This offers limitless scope for intrigue and amusement to lift your mood. It could for example involve meeting a famous person in the most unusual of circumstances. Or perhaps travelling back or forward in time.) *(Optional)*

13. Describing an ongoing story involving a character other than you.

[More Info](#)

(HINTS: This is effectively like writing a short story or part of a novel. So if creative writing is something that interests you, this option might be particularly appropriate.)
(Optional)

14. Please indicate how you are feeling now, as you complete your Daily Break session.

	Extremely negative	Quite a bit negative	Slightly negative	Neutral	Slightly positive	Quite a bit positive	Extremely positive
a. Your main feeling / emotion now?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Now slowly take a few moments to reorient yourself back to the present, to the here and now.

Remind yourself what you were doing, or were about to do before your break.

Feel your mood now and try to carry this forward with you.

[Continue >](#)

My Daily Break



End of "Daily Break" session

Thank you for completing your session today.

Please make a note somewhere to remember to do your next session. Thank you.

MORE INFORMATION BOX CONTENTS – Question 8

No additional information provided

MORE INFORMATION BOX CONTENTS – Question 9

EXAMPLE ANSWERS

Scene

Looking out of my window, there's a courtyard / parking area with a very high brick wall at the back. Beyond the wall, there are trees and the ground around them is quite overgrown. I've just noticed a small cat, not a kitten, but quite young. It's on the top of the wall, leaning over the edge, preparing to jump, but hesitating. It's obviously not sure if it can handle that height. He's tentatively edging backwards and forwards. I think it's a bit high for him (or her). He's evidently decided the same, as he's now continuing along the wall. His ears have just pricked up, as I think he's seen a bird in the trees ...

Object

The object I'm going to describe today is my stainless steel water bottle. A lot of people wouldn't even notice it and probably certainly wouldn't describe it as an object of beauty. But I think it's really well designed. It's about the height of a traditional Coke bottle. It has a polished silver colour. It's quite sleek. The sides aren't perfectly straight. There are two curves. It's also a good size to grip in the hand. It has a black plastic screw top, quite chunky and a wide neck. This makes it easy to clean inside. It has no lining, just the same stainless steel inside and so the water tastes nice and fresh ...

TIPS

- As illustrated with the above examples, you don't necessary need to write about amazing things to find the activity absorbing.
- The subject matter can be just everyday objects or events.
- What tends to be absorbing here, is simply trying to find the right words to express yourself.

MORE INFORMATION BOX CONTENTS – Question 10

EXAMPLE ANSWERS

Remembered object

A painting that I really like is one by Renoir. It's really well known. It's called the 'Dance at the Moulin de la Galette'. There's a kind of dappled lighting effect with lots of people dancing, probably waltzing, in an outside arena shaded by trees. At the edge of the arena, there are people chatting, some standing, some sitting on benches or at little café tables. I think the period is probably late 19th century. It's vibrant and joyful, people in their Sunday best, socialising and having fun. It's intriguing how Renoir must have gone about capturing something like that. There were so many people. As it's impressionist, not all the characters are precisely painted. Many are just flourishes of the brush, but it works. It really communicates a sense of lightness and fun ...

Remembered scene

I can remember the first time I ever saw a famous person. I think I was in primary school, around 8 or 9 at the time. The then Prime Minister, Harold Wilson, came to give a speech at a local hall. I can't remember the exact circumstances and I can't remember the speech, but I can remember the excitement of waiting behind a barrier for him to pass by. And when he did, it was so close. And the strange thing that struck me was how pink his face was. I think it was because I'd only ever seen him in black and white before. We only had a black and white TV and there were no coloured pictures in newspapers back then. Obviously, I was used to seeing everyone else in colour, but it was strange how seeing this famous person for the first time in colour struck me.

TIPS

- As illustrated with the 'remembered object' example, you don't have to restrict yourself to just physical descriptions of a painting for example. You can write about the kind of thoughts it conjures up, e.g. wondering about the artist, or perhaps the lives of the people in the pictures.
- You can go where you want with your writing. Just explore whatever avenue appeals to you.

MORE INFORMATION BOX CONTENTS – Question 11

EXAMPLE ANSWER

I can imagine myself in Paris. I'm sitting in a café, next to the window, looking out onto the streets. It's dark outside and raining, neon lights reflecting on the wide pavements. I watch pedestrians hurry by, straining against the wind and rain as they make their way home. Inside the café, it's nice and cosy, with the smell of coffee and French perfume. When the door opens, as customers come and go, the beeping horns of the traffic intrude for a few moments and then fade out again ...

Tips

- Try to make the images as rich and as vivid as possible.
- Feel what it's like to be in that scene or situation and try to capture that in your writing.
- Many people find thinking about nature particularly relaxing, though as illustrated with the example above, the setting can be any type of environment.

MORE INFORMATION BOX CONTENTS – Question 12

EXAMPLE ANSWER

I'm imagining meeting Brad Pitt and Angelina Jolie. But I'm not a fan. I'm working for a charity in Africa and they're on a good will ambassador mission. We're going to a remote village to inoculate children against various illnesses. I'm aware of who they are, but haven't mentioned films or anything. We're just talking about the charity work. They're polite to me but seem a bit niggly with each other. The truck we're travelling in breaks down and we have to camp overnight until help arrives. We end up sitting around a camp fire under the stars, just talking about life. Then all of a sudden, a circle of light appears in the sky. It gets closer and closer and appears to be a kind of flying saucer. The light gets more intense and three aliens are beamed down. Two are medium sized and one smaller. They appear to be two parents and a child. The parents keep nudging the child towards us, but it is rather shy. Eventually though, it plucks up the courage and approaches us. In fact, it approaches me, with a small book and pen in its hand. Then with a robot-like voice, it asks if it can have my autograph. I scribble my name. The child thanks me, then is beamed up with its parents and the

flying saucer disappears. Brad and Angelina's expression is priceless. I just shrug and say, 'Don't you just hate it when that happens!'

TIPS

As illustrated above, humour can be particularly useful in lifting mood. In another similar example, a previous participant wrote about meeting the Queen in McDonald's.

Note: As explained in the participant information sheet at the start of the study, the research is not concerned with the details of what you write, but rather the types of activity. So for example, if writing about a particular famous person, you don't need to write their name. You can just write 'X'.

MORE INFORMATION BOX CONTENTS – Question 13

EXAMPLE ANSWER

CHAPTER 1

James gazed at the overhead projector perched before him. He'd raised, lowered, tilted and swivelled the contraption in every possible direction, but the all-important switch still eluded him. A bead of sweat trickled down his forehead, along the ridge of his nose and splattered onto the glass plate below. Around the conference table, four men and four women in grey suits looked on in silence. A second bead of sweat hit the plate in the exact same spot as the first ...

TIPS

- You don't need to have an idea for a whole novel.
- You can just write scenes or sketch out ideas.
- As with the previous activities, the key is to explore any avenue that appeals to you.

Appendix E11: Study 3: Daily focus training guidance notes

Training Guidance Notes - Daily Focus



Page 1 of 11

Welcome to the Daily Focus training programme

There are **8 sections** shown below. Please take your time and **read these notes carefully**. It should only take about **20 to 30 minutes**.

Section 1 - Login

Section 2 - Stress, its impact and the solution

Section 3 - Balancing your impulsive and rational self

Section 4 - Strategic intelligence

Section 5 - Perceptual intelligence

Section 6 - Tactical intelligence

Section 7 - Key questions about the training programme

Section 8 - Confirmation of participation

Whenever you want to review any sections, you can log in again at a later date. You won't need to complete section 8 again. You can simply close the browser window when you reach that section again.

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[Continue >](#)

Training Guidance Notes - Daily Focus



Page 2 of 11

Section 1 - Login

1. Please enter the **participant ID number** you were given

[More Info](#)

2. Please enter **today's date**. (Just click on 'Today' at the bottom of the calendar box. The box appears when you click in the answer space below).

 (DD-MM-YYYY)

3. Please enter the **time now** to the nearest minute (e.g 9.06 am, 4.38 pm etc)

[Continue >](#)

Page 3 of 11

Depending on your **security settings**, you may get a **pop-up** on the next page asking:

"Do you want to view only the webpage content that was delivered securely?"

To see the '**STRESS IMBALANCE FIGURE**' referred to in the text, click - '**NO**'.

[Continue >](#)

Section 2 - Stress, its impact and the solution

What is stress?

As illustrated in the figure below, stress can be viewed as an imbalance (real or imagined) between demands and resources in pursuit of a particular goal or goals. Thus we feel stressed when the demands placed upon us (e.g. workload, duties, personal commitments to family and friends etc.) appear to exceed the resources available to us (e.g. time, money, energy, knowledge, skills, help from others etc.) to meet those demands.

What is the impact of stress?

When we feel overstretched, unable to achieve the various goals we or others have set for ourselves, this affects us both psychologically and physically. When we are making progress towards our goals we experience positive thoughts and emotions. When our progress appears blocked or threatened, we experience negative thoughts and emotions (e.g. frustration, anxiety, worry, panic, anger). These negative emotions in turn trigger the release of stress hormones such as adrenaline and cortisol which mobilise the body to take corrective action to overcome the perceived problem.

In short bursts these reactions are not necessarily a problem and may even be beneficial. However if the stress persists over months and years, repeated triggering of stress hormones such as cortisol can contribute to a wide range of physical and mental health problems.

So what is the solution to stress?

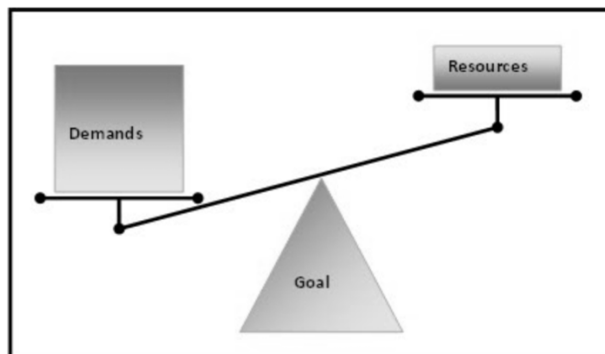
As stress stems from a perceived imbalance between demands and resources in pursuit of a particular goal or goals, there are 3 possible ways to reduce that stress:-

1. Revise our goals
2. Reconsider our perceptions of the situation
3. Take action to reduce the demands on us and/or increase the resources available to meet those demands

These 3 ways of reducing stress correspond to 3 types of 'intelligence' skills (1. **Strategic**, 2. **Perceptual**, 3. **Tactical**). The first is about setting priorities and choosing goals that are realistically achievable. This is addressed in a single session at the start of the training. The second is about improving your understanding of yourself and your situation. The third is about becoming smarter and more effective in how you set about achieving your goals. The second and third sets of skills are addressed in your Daily Focus sessions.

To be able to apply these skills effectively however, it is important to understand certain key features of how your brain works. Otherwise your efforts can be easily undermined. The next section therefore explains:

- The role of two distinctive parts of your brain.
- How imbalance or conflict between these two parts can sometimes undermine your efforts to reduce stress.
- What you can do to overcome this.



Continue >

Section 3 - Balancing your impulsive and rational self

There are two distinctive parts of your brain which play different roles in helping you respond to stressful situations. They are referred to as **'the impulsive self'** and **'the rational self'**. Though interlinked, they are rooted in different parts of the brain which have evolved at different times to serve different functions.

1. The Impulsive Self - PRIMITIVE - (UNTHINKING / REACTIVE) - CHILD

This is an older part of the brain (the limbic system) adapted for primitive environments, in which our survival was constantly under threat. Quick reactions were essential - commonly referred to as the **'fight, flight or freeze response'**. Our impulsive self therefore makes snap decisions, black and white judgements based on current emotions and impressions. It is guided by the here and now, craving simple certainties and immediate results. No thinking effort is involved. It is instant and automatic, geared to basic drives (e.g. hunger, sexual attraction) and raw emotions (e.g. anger, fear).

2. The Rational Self - ADVANCED - (THINKING / PROACTIVE) - ADULT

This more recent part of our brain (principally the prefrontal cortex) has evolved to deal with the complexities of life in modern human societies, where threats tend not to be so immediate and getting what we want requires more than just strength or speed. Our rational self (*also called 'reflective self'*) therefore is calm and thoughtful. It gathers evidence to gain a clearer understanding of any perceived threats or opportunities and applies logic and reasoning, critically weighing up evidence and options to decide appropriate courses of action. This requires effort and often involves delaying present gratification to achieve longer term gains.

Achieving the right balance

Thinking rationally is particularly important in times of stress. However when we feel threatened or stressed, the impulsive self is more strongly primed and it takes more effort for the rational self to seize control. If too tired to make this effort, we often give in to our impulsive self and follow its simple black and white dictates e.g. fight (get angry, blame someone else) or flight (ignore or run away from the problem e.g. letting unpaid bills pile up on the mat). If you're tired or stressed when reading this, your brain may well be sending you conflicting messages e.g.:

- **Impulsive self** - *'I don't feel like doing this. I haven't got time. I'd rather watch TV.'*

- **Rational self** - *'It won't take that long. This is an opportunity to learn something that can help me. I need to make the effort if I truly want to improve my situation.'*

Benefits of this training programme

1. It should help improve your awareness of the impulsive and reflective/rational aspects of your own and others' behaviours.
2. It should help you learn when best to use your rational self and when to give in to your impulsive self.
3. It should help enhance the depth and quality of your rational thinking which in turn should give you more options for overcoming problems and progressing towards your goals.

The better you understand and manage the balance between these two parts of your brain, the greater the benefits when applying the 3 types of intelligence skills outlined in the next sections.

The first is **strategic intelligence**, which is about setting clear goals for yourself.

Continue >

Section 4 - Strategic Intelligence (SI)

Strategic intelligence is about developing a clear idea of what exactly you want from life and how you intend to achieve it. This is particularly important in reducing stress, as your choice of goals and likelihood of achieving them largely determine the amount of stress you encounter.

Psychological research highlights **3 core needs** beyond basic food, shelter etc., that are fundamentally important to most people. They are:

-(i). **To feel good about ourselves** (usually through what we do and / or how we do it e.g. through our competence, skills, knowledge, professionalism, principles, honesty, kindness, sense of humour etc.).
-(ii). **To have good relationships with others** (e.g. being considerate and supportive to family, friends, colleagues etc., and being supported in return).
-(iii). **To have a sense of choice and control over how we live our lives** (i.e. what we choose to believe in and strive for, and how we choose to behave).

For the third need there are clearly many things in life we can't control. But we can control what's most fundamental i.e. how we approach what we do each day and how we respond to whatever happens. We also have considerable choice in how we choose to feel good about ourselves and how we treat and interact with others. In modern society however it is easy to lose sight of these core needs and goals. The pace and demands of life often tend to push us into **impulsive self** mode, which drastically narrows the time-frame and focus of our thinking. This in turn significantly limits our choice and control of options for satisfying our needs.

Strategic intelligence therefore involves engaging your **rational self** to broaden your thinking to give yourself more choice and control. There's little you can change over the next few minutes, but a vast amount over the next few weeks, months and years. To make the most of your opportunities however you need to pursue:

-1. the **right goals** -- i.e. that address your **core needs**, which means thinking about what's fundamentally important to you in life and how to enhance this.
-2. in the **right way** -- i.e. that helps minimize stress / maximize success in pursuing your most important goals.
-3. at the **right time** -- i.e. when most appropriate, which means thinking ahead, clarifying what you need to do and when and ensuring you do it.

1. Deciding on the **right goals** is not something that can necessarily be squeezed into a 2 week training period. We all differ in terms of knowing what we really want from life. So during the training, your focus can simply be on your current priorities. However if you are already clear about your long term goals, you can work on these too.

2. The **right way** is essentially about simplifying your route to whatever you want to achieve. The same techniques apply whether at the strategic level (long term goals) or tactical (short term, day to day goals). The Strategic Intelligence session of the training (the first activity, next Monday) will demonstrate how one particular technique (**problem rebalancing**) can be used to simplify your progress towards long term goals. There are 4 activities outlined below. Each highlights a different route to help you minimize stress / maximize success in pursuing your goals:

Activity 1: Reducing **external demands / sources of stress** - e.g. being better able to limit or resist taking on too much.

Activity 2: Reducing **internal demands / sources of stress** - e.g. challenging your own possibly excessive, unrealistic or unnecessary expectations.

Activity 3: Increasing **internal resources / sources of competence or control** - e.g. developing personal or work related skills.

Activity 4: Increasing **external resources / sources of support** - e.g. improving co-operation with colleagues and others you might rely on for help.

3. The **right time** is essentially about planning i.e. breaking down longer term goals into intermediate steps and clarifying what you need to do and when e.g. this month, this week, today. It is also addressed in next Monday's strategic intelligence session.

Benefits of developing your strategic intelligence

This should help you reduce stress / make better progress towards your goals, by:

- 1. Clarifying your priorities and simplifying how to achieve them.
- 2. Ensuring that day to day you don't lose sight of the core goals you want to pursue.
- 3. Encouraging you to focus your effort on the many things you can control, rather than what you can't.

Continue >

Section 5 - Perceptual Intelligence (PI)

Improving your understanding of daily events and the emotions they trigger - (Part of Daily Focus session)

Perceptual intelligence is about developing your ability to make accurate and balanced assessments of whatever problems or opportunities you face. The Importance of perceptual intelligence stems from the fact that our emotional and behavioural responses to events are triggered not by events themselves but by our perceptions of events. Thus the more balanced and accurate your perceptions, the more likely you are to respond appropriately. This in turn should help you make better progress towards your goals.

When we are tired or stressed (e.g. when progress towards our goals appears blocked or threatened), the first part of our brain to react is our **impulsive self**. As it is wired for speed rather than accuracy, it often takes simplifying shortcuts known as '**perceptual biases**' to arrive at snap decisions. Examples of such biases, explained later in the training, are:

- Tunnel vision
- Emotional reasoning
- Over-generalisation
- Jumping to conclusions without adequate evidence

Impulsive judgements can serve us well in physical emergencies, but are often not so helpful in dealing with the complexities of modern life. Primitive 'fight or flight' impulses for example tend not to provide the best of solutions for addressing excessive workload or strained relationships. Perceptual intelligence therefore involves engaging your **rational self** to push beyond your initial impressions and emotions, to come up with a more balanced and constructive assessment of your situation and options available.

There are 3 Perceptual Intelligence activities. Each deals with a different emotion, signalling different states of perceived progress towards goals:

Activity 1: Understanding negative emotion - *i.e. signal that a goal appears blocked or threatened.*

Activity 2: Understanding positive emotion - *i.e. signal that progress appears satisfactory.*

Activity 3: Understanding neutral/flat emotion - *i.e. signal that there's no apparent goal threat, but no goal progress either.*

For whichever emotion you are experiencing, there are 3 steps to help you respond appropriately:

Step 1: Noting your initial emotions, the goals involved and any assumptions or biases that may be present - i.e. **impulsive reacting**.

Step 2: Noting the objective facts and trying to come up with a more balanced, open-minded interpretation of events - i.e. **rational thinking**.

Step 3: Noting any constructive actions you can take to improve the situation - i.e. **rational acting**.

Benefits of developing your 'perceptual intelligence'

1. It helps avoid stressful over-reactions caused by hastily jumping to the wrong conclusions.
2. It helps you shift from worrying about problems which drains your emotions, to overcoming problems which lifts your emotions.
3. It helps you find more appropriate solutions to problems and better ways of achieving your goals.

The next set of skills, **Tactical intelligence**, then help you put your solutions into action.

Continue >

Section 6 - Tactical Intelligence (TI)

Developing your resourcefulness in pursuing your goals - (Part of Daily Focus session)

'Tactical intelligence' refers to the organisation, flexibility and resourcefulness with which you set about achieving the goals you have decided to pursue. This involves clear thinking, effective planning, adaptability, creativity and resilience in overcoming obstacles. The more you develop such skills, the less stressed you should feel when encountering potential problems and more confident of success.

To be able to apply these skills you will need to engage your **rational self**. In times of stress however, as mentioned earlier, your **impulsive self** tends to come to the fore and is often too impatient to pause and think things through. It typically only sees one course of action - usually carrying on the same as before, but just working harder or longer. The Tactical Intelligence activities however offer 'smarter' rather than 'harder' ways of working.

There are 6 activities designed to help you figure out the best way to approach each day. They help you think around problems or break them down into smaller more manageable parts. They also encourage better timing and balance of activities across the day. The end result is that you should eventually experience smoother less stressful days, where you feel more in control and able to make better progress on what's important to you. The issues addressed in the activities are as follows:

Activity 1: Deciding your personal priorities for the day.

Activity 2: Deciding the best time to do them.

Activity 3: Making tasks easier through 'problem rebalancing' i.e. reducing demands and / or increasing resources.

Activity 4: Finding creative ways around problems.

Activity 5: Keeping on track with your long term goals.

Activity 6: Shaping your physical and social environment to help you.

Note: You don't need to use each activity every day. You just use whichever tool appears most appropriate to your current situation.

Benefits of developing your tactical intelligence

It should help you feel more in control and make better use of your time, by:

1. Having a clear and refreshing sense of purpose and plan for each day.
2. Ensuring a balanced approach, not neglecting or forgetting key issues.
3. Working in line with how your brain operates (i.e. balancing your impulsive and rational self), rather than struggling against it.

Continue >

Section 7 - Key questions about the training programme

What basically do I need to do?

1. Strategic Intelligence session - one session - next Monday -10 - 20 minutes

This involves thinking of ways of reducing stress by limiting the demands on yourself and increasing the resources available to you. Any ideas can then be applied in your Daily Focus sessions.

2. Daily Focus sessions - (Perceptual and Tactical intelligence activities) - 7 sessions - Tuesday to Friday next week / Monday to Wednesday the week after - 10 minutes per session

This involves taking a few minutes each day to assess your situation, figuring out how best to respond and then translating this into a clear plan of action.

Why is writing or noting things down important?

If you just think about things in your head, you tend to go round in circles (e.g. fretting, ruminating about possible threats). This **impulsive self** thinking just wastes your energy, without bringing you any closer to a solution. Writing things down however facilitates more constructive **rational self** thinking. It helps you see things more clearly. It enables you to capture and develop ideas, think through options and arrive at clear decisions as to what you can do to improve things. It then helps you remember what to do.

What benefits can I expect from this training?

Everyone is different and will take different things from these activities. Whatever your starting point, the idea is to extend yourself beyond where you are now. If you never usually plan, just making a simple plan can make a big difference. If you already plan each day, you can use the Daily Focus activities to make your planning even more effective.

The ultimate benefit of the training is not that you end up with a life that is problem free. That doesn't exist. Rather it is to help you feel more relaxed and confident in the face of problems, knowing you have the skills to make the best of whatever comes your way.

Other benefits highlighted by previous participants in similar work situations include:

- ...- *Understanding my own behaviour and feelings better.*
- ...- *Realising I can think and act differently.*
- ...- *Being more realistic and clearer about my goals and how to achieve them.*
- ...- *Feeling calmer, more in control.*
- ...- *Feeling more confident and satisfied in how I handle difficult tasks and situations.*
- ...- *Appreciating my family and friends more.*
- ...- *Improving work relationships*
- ...- *Feeling relaxed and sleeping better knowing I have the next day sorted (i.e. well planned out).*

Continue >

Section 8 - Confirmation of participation

From the guidance notes you should now have a general idea of what the training involves. Your understanding will develop further as you practise the activities

Most participants quickly learn the techniques and complete the series of daily sessions with little or no difficulty.

We recognise however that this training may not appeal to everyone. Consequently if you feel it is not for you and don't want to try it for the next week and a half, please feel free to withdraw now.

Questions 4, 5, 6 and 7 should help you decide

4. Do you think you are stressed?

- ☐ I don't think I am stressed.
- ☐ I am unsure if I am stressed.
- ☐ I think I am stressed
- ☐ Other (*please specify*):

5. Do you want to take action now to address your stress?

- ☐ I have decided I don't want to take action now.
- ☐ I am unsure whether or not I want to take action now.
- ☐ I have decided I want to take action now.
- ☐ Other (*please specify*):

6. From what you have read about the present training programme, do you think it might be able to help you?

- ☐ I don't think this training can help me.
- ☐ I am unsure whether training can help me.
- ☐ I think this training can perhaps help me.
- ☐ I think this training can definitely help me.
- ☐ Other (*please specify*):

7. Have you had any previous training similar to the programme described here?

- ☐ No I haven't had any training similar to this.
- ☐ I am not sure if I have had training similar to this.
- ☐ Yes I have had training similar to this.
- ☐ Other (*please specify*):

Your decision

8. Would you like to proceed with the training programme?

- ☐ Yes, I confirm I would like to proceed with the training. (Note: If yes, please answer question 9 only.)
- ☐ No, I have decided to withdraw. (Note: If no, please answer questions 10, 11 and 12 only.)

**If you wish to proceed, please answer Question 9 and then continue to the last page.
(Please ignore 10, 11 and 12 which are for withdrawing.)**

9. At which **specific moment** each day do you plan to do your Daily Focus sessions? (**Note:** It only takes about 10 minutes but **importantly it needs to be a time when you can relax and think things through.**) Please see **More Info.** (Optional)

More Info

- When I'm just winding down at the end of my working day i.e. the last thing I do before I go home (to plan for next day)
- When I'm relaxed in the evening e.g. just arrived home / just before dinner or TV or bed (to plan for next day)
- When I sit down at my work desk first thing in the morning, before I do anything else (to plan the current day)
- Other (please specify):

If you are proceeding with the training, please now continue to the last page.

If you have chosen to withdraw, please answer Questions 10, 11 and 12.

Then simply continue to the last page, then close the tab/browser window and your decision to withdraw will have been noted.

10. If you choose to **withdraw**, you do not need to provide an explanation. You can just type 'n/a'. However if you are happy to do so, any comments explaining your decision would be much appreciated. This could help us improve the programme design or better tailor it to different interests. (Optional)

11. If you choose to **withdraw**, would you still like to receive (by email) a report of the eventual findings of the study? (**Note:** This will be available to all participants.) (Optional)

- Yes, I would like to receive a report of the study findings.
- No, I do not want to receive a report of the study findings.

12. If you choose to **withdraw**, would you be prepared to complete a short online questionnaire in two weeks time? (This will help us compare stress related measures for those who do the training and those who don't.) (Optional)

More Info

- Yes, I will complete the questionnaire.
- No, I would prefer not to complete the questionnaire.

Continue >

Training Guidance Notes - Daily Focus



Page 11 of 11

End of "Training Guidance Notes"

Thank you for reading these notes.

If you are proceeding with the training, when you are ready to start the first activity, your **Strategic intelligence session**, the link is:-

<https://www.survey.bath.ac.uk/strategic1>


PLEASE COPY AND SAVE THIS LINK NOW

Please note: Your **Strategic intelligence session** is scheduled for **next Monday**.

Thank you for completing this stage of the study.

If you are withdrawing, thank you for giving this your time and consideration.

Appendix E12: Study 3: Strategic intelligence session

Strategic Intelligence Session 1

Welcome to your Strategic Intelligence session

This first activity helps you come up with **ideas for reducing stress** that you can apply in the rest of the programme. It usually takes around **20 minutes**, but you can spend whatever time you wish. There are just two sections:

•

Section 1 - Login.

Section 2 - Strategic intelligence - problem rebalancing addressing 4 key ways of reducing stress.

•

At the end of this activity you will have the option of **printing** a copy of your answers for later reference.

Please note that once you have clicked on the CONTINUE button at the bottom of each page you can not return to review or amend that page.

[Continue >](#)

Confidentiality

All data collected in the study is **anonymised**, which means that it will not be possible to identify individuals in any of the analyses or reports produced.

The research is designed to explore links between the frequency of use of the various training activities and changes in participants' well-being. To enhance your privacy and anonymity we would suggest that you just use **initials or abbreviations** rather than names of people or places etc.

The research focus is on which activities are used, not the particular details that participants enter. Thus you can be as cryptic as you like. Whatever you note just needs to make sense to you, not to anyone else.

If you have nothing to write for a particular section - just type 'n/a'.

[Continue >](#)

Section 1 - Login

1. Please enter the **participant ID number** you were given.[More Info](#)

2. Please enter **today's date**. (Just click on 'Today' at the bottom of the calendar box. The box appears when you click in the answer space below).

(DD-MM-YYYY)

3. Please enter the **time now** to the nearest minute (e.g 9.06 am, 4.38 pm etc)

Your aim in the activities that follow should be to generate ideas to apply in your subsequent Daily Focus sessions.

[Continue >](#)

Section 2 - Strategic Intelligence - Problem Rebalancing

The basic questions for you to consider are shown in bold type. (HINTS for how to approach the question are shown in brackets.)
Clicking on the "More Info" button to the right of each question will give you examples of how others have answered these types of questions.

In some cases there are also additional tips on how to get more out of each question.

You can write as much or as little as you like. The key is that you develop ideas that are useful to you.

4. How can you reduce external pressures that cause you stress?[More Info](#)

(HINTS: What types of occurrences or situations (stemming from external demands i.e. from other people) do you find most stressful, taxing, frustrating, worrying, annoying etc.? What are the root causes? What can and are you doing to gain / exercise more influence / control over your environment(s), so that ultimately you experience fewer of these things you dislike?)
(Optional)

5. How can you reduce internal (self-generated) pressures that contribute to stress?[More Info](#)

(HINTS: How might your personal goals or expectations be adding to any pressures or stress? What are you doing or can you do to clarify/simplify what you expect of yourself (e.g. prioritisation, realistic and appropriate goals). (Optional)

6. What personal resources can you develop in yourself to overcome stress?[More Info](#)

(HINTS: What personal attributes, attitudes, skills, knowledge etc., do you feel would help you better deal with stressful situations? What are you doing or can you do to improve your competence/skills in ways that would help?) (Optional)

7. How can you get more help from others?

[More Info](#)

(HINTS: What kind of practical help and support do you get from others in handling things that stress you? Where and how might this support be better? What are you doing or can you do to improve or make better use of the support that might be available?) *(Optional)*

**Having considered these questions, the next step is to decide which actions to carry forward to your 'Daily Focus' sessions.
For now just choose one or two priorities, things you can definitely see yourself doing and note them down below.**

8. What action(s) will you definitely take to help reduce stress? What's your priority? What's your time plan?

[More Info](#)

(HINTS: To keep it simple, focus on one key action that you noted above - though more are possible if you wish. Then, with whatever time planner you use, decide on key steps you need to take and when. You can then address how best to do this in your Daily Focus sessions.)

(NOTE: If you can't think of any 'problem rebalancing' action to reduce stress in general, try to think of an action you can take to make a current work or personal priority simpler. If nothing comes to mind, just type 'n/a' for now.)

[Continue >](#)

Strategic Intelligence Session 1



End of "Strategic Intelligence" session

Thank you for completing the strategic intelligence session.

The next step for tomorrow is to begin your **Daily Focus** sessions. The link is:

<https://www.survey.bath.ac.uk/mydailyfocus>

PLEASE COPY AND PASTE THIS LINK SOMEWHERE - NOW - SO THAT YOU CAN REGULARLY ACCESS THE 'DAILY FOCUS' WEBPAGES

Good luck turning your plans into action!

MORE INFORMATION BOX CONTENTS – Question 4

EXAMPLE ANSWERS

External source problem(s)

- (i) Having work tasks unexpectedly dumped on me with really short deadlines.
- (ii) Having to follow poorly designed procedures that take up too much time.
- (iii) Having constant interruptions that stop me getting on with important tasks.

Cause(s)

- (i) There is not enough forward planning or communication about workload and deadlines.
- (ii) I think a lot of procedures have just evolved and been extended overtime and no one has really made an effort to challenge or improve them.
- (iii) I think part of the interruptions are due to the fact that people often don't know where to go for help and just assume it might be part of my job role.

Action(s)

- (i) I'll talk this over with my boss. I'll ask for an indication of what kinds of things are coming up in the next few weeks/months, so that I'll have more time to prepare. I'll also ask for clarification on what the priorities are.
- (ii) I'll get together with some colleagues and see if we can come up with some proposals to modify procedures that don't really work.
- (iii) I'll get clarification from my boss or personnel on what exactly is covered by my role. I need to find out whose responsibility certain things are that I get asked about and signpost people to them straight away rather than getting involved myself. I can also alter the time I do things, so that I work on difficult things at times when I'm least likely to be interrupted.

MORE INFORMATION BOX CONTENTS – Question 5

EXAMPLE ANSWERS)

Self-generated problem(s)

- (i) I often take too long over tasks. And that puts me under time pressure.

- (ii) I'm trying to do too many things at once.

Cause(s)

- (i) I'm a bit of a perfectionist, which is not necessarily a bad thing, as I take pride in doing my job well. But obviously not everything can or needs to be perfect. There may also be an element of insecurity, trying to over deliver, because I'm not really sure what's good enough.
- (ii) Some of the things I'm pursuing are only half thought out. For example, I thought it would be good to learn a foreign language, but I'm not really enjoying the classes or getting anywhere with it. It would be nice to say a few phrases on holiday, but I'm not going to use it for anything beyond that.

Action(s)

- (i) I'm going to get a clearer idea of people's expectations for certain tasks and then just do what's necessary. Each time I start something, particularly a big task, I'll think about how I can keep it simple, how I can cut it down in some way. I'll try it on a few different things and see what happens.
- (ii) I'm going to stop the language classes and spend the time doing something a bit more physical, e.g. just going for some nice walks.

TIPS

- For the perfectionism issue, it might be useful to consider the concept of '**satisficing**' as opposed to '**maximising**', i.e. being content with something that is 'good enough' as opposed to 'perfect', particularly for peripheral issues.
- If you do want to excel in something, try to frame your ambition/goal in terms of things you can control, e.g. becoming skilled in something, rather than admired or famous for something, which you can't control. Developing a skill for its inherent value, rather than for something else it might bring, offers deeper and more enduring satisfaction. It also renders your goal less susceptible to external blocks or threats. This in turn reduces your vulnerability to stress.
- This last point illustrates an important distinction between **process goals** and **outcome goals**. At work, a 'process goal' might, for example, be to do your job skilfully and professionally. An 'outcome goal' might be to gain promotion. Both are ways of feeling good about yourself, but 'process goals' are superior in terms of long-term satisfaction and resistance to stress. A promotion may depend on many

things beyond your control and thus can easily be threatened or lost. However, your personal skills, professionalism, integrity, etc., are much more within your control and therefore less vulnerable to threat.

MORE INFORMATION BOX CONTENTS – Question 6

EXAMPLE ANSWERS

Additional internal resources

- (i) I want to become even more skilled in what I do. If my IT skills were better, I would be able to work more efficiently. I think there are lots of time-saving features I haven't learnt to use properly.
- (ii) I would like to feel more confident in general. I sometimes find it hard, for example, to say no to people's requests.
- (iii) I would like to be calmer, to take things more in my stride. It would help if I could learn to get less worked up about things and not over-react, which usually only makes things worse.

Actions

- (i) I will look into what IT training courses are available and try to get booked onto one.
- (ii) I will read up on 'assertiveness' on the Internet, and then look for opportunities to practise it in different situations.
- (iii) I'm going to work on being calmer. To help do this, I will take time (Daily Focus sessions) to prioritise and plan better and to avoid having to rush to do things at the last moment. I will also practise not reacting immediately to situations, i.e. operating more in 'rational' mode rather than 'impulsive' mode. This will mean learning to remove myself from situations, taking time out and thinking things through before reacting.

TIPS

Again, it should be helpful in clarifying your objectives to use the distinction between '**outcome**' goals and '**process**' goals, further illustrated below:

- **Outcome goals** (WHAT) – These goals are generally things you want to achieve in the external world, e.g. completing a work project, reorganising your office, signing up for some training.
- **Process goals** (HOW) – These goals refer to how you want to act or be in carrying out your various activities, e.g. being calm, relaxed, confident. To 'be' or 'act' a certain way, you need to find or make regular opportunities to practise this.

Notes

1. As mentioned before, we generally have far more control over 'process' than 'outcome' goals. So it is usually more satisfying and less stressful if you can to set your objectives in terms of 'process goals'.
2. Even with process goals, however, it can be difficult to change behaviour on the spot, i.e. particularly in the heat of the moment when your **impulsive self** is automatically reacting to things. It helps, therefore, if you can use your **rational self** to think ahead and mentally rehearse new ways of acting or reacting. However, be patient with yourself. It takes time to learn new habits or ways of being.

MORE INFORMATION BOX CONTENTS – Question 7

EXAMPLE ANSWERS

Additional external resources

- (i) It would be good if we had more of a group or team atmosphere in the office, instead of each of us tending to work head down, doing our own thing. For example, it would help if we discussed any difficulties more and got input or advice from each other.
- (ii) Like a lot of my colleagues, I'm not getting on very well with the new photocopier. It's supposed to be able to do all these amazing labour-saving things, but it just seems too complicated and I haven't got time to plough through the manual. It would be helpful if someone who understands it all could give us a demonstration.

Actions

- (i) I'm going to set the ball rolling by asking J's opinion on how best to handle the problem I've been having with L. In return, I'll offer to try to help J if she's having difficulties with anything.

- (ii) I'm going to contact [relevant co-ordinator/department] to see if someone can come to our office and give us 10 or 15 minutes' training on how to do some of the more complex things on the photocopier.

TIPS

- We are surrounded by countless potential sources of help, information and support. These include for example:
 - family
 - friends
 - work colleagues
 - various support teams/departments within our organisations
 - potential support from people in other organisations
 - the Internet – offering access to virtually limitless information and contacts
- Whatever issue or problem we're dealing with, there's likely to be someone who can offer practical help, advice or some useful information. So there's no shortage of potential help out there. The problem is often that we just don't look or think to ask. Or perhaps we don't ask the right people. So a bit of thought and imagination can help – as well as initiative. Thus, rather than just waiting and hoping that help might arrive, we need to actively search for it.

MORE INFORMATION BOX CONTENTS – Question 8

EXAMPLE ANSWER

Priority 1

I will take more initiative at work, particularly on improving communication with B and K, to get a better understanding and agreement on work priorities, role clarification, training possibilities, and better sources of support.

Plan for Priority 1

I aim to make several changes by (*precise date*). I will do this gradually and start with some easy things first. (**Note:** *Don't overload yourself. Consider spreading things out over time, as illustrated below.*)

Week 1

- I will start with a casual chat with B and ask him what changes are in the pipeline and how we can best prepare for them.
- I will get out my job description and prepare a short summary list of job headings. I will also list all the extra things I've been getting saddled with. I will do this on (precise date). I will then ask B which things he would like me to prioritise and who, in theory, should be doing the extra duties. I will do this on (precise date).

Week 2

- I will see if K can get me onto a training course for at the start of the new financial year. I'll prepare some justification/arguments for how it should help with our key projects. I will do this on (precise date). If it's not possible, as a back-up plan, I'll see if someone who has done the training can spend twenty minutes showing me some of the basics.

Priority 2

To minimize the demands on my time, I will drop my language classes.


Plan for Priority 2

I will telephone the language centre tomorrow morning. I'll see if I can get a rebate for unused classes.

TIPS

- Only focus on actions that you are definitely committed to, i.e. where you can see clear benefits and a feasible course of action.
- Break down long-term goals into simple, small steps that you can take on a daily basis. This usually involves noting down desired or necessary target dates for completion, then working backwards, planning intermediate targets (e.g. what you need to do by the end of this quarter, this month, this week, etc.). **Don't overdo the planning however. Keep it simple.**
- **Focus on what you can control.** When, for example, you make a request of your boss or another colleague, you can't control the other person's response. What you can control is your own behaviour, i.e. in actually making the request and in doing it in a way that hopefully maximises the chances of achieving the kind of the outcome you're aiming for. You can also control how you respond.

Appendix E13: Study 3: My daily focus sessions

My Daily Focus

Welcome to your Daily Focus session

This is your moment to **decide and note your key actions for the coming day.**

.

Section 1 - Login.

Section 2 - Using Perceptual Intelligence:..... usually **1 ACTIVITY** per day.

Section 3 - Using Tactical Intelligence:..... usually **2 to 3 ACTIVITIES** per day.

.

You will have the option of **PRINTING** your answers if you would like to retain a copy.

Please note that once you have clicked on the **CONTINUE** button at the bottom of each page you can not return to review or amend that page.

[Continue >](#)

Section 1 - Login

1. Please enter the participant ID number you were given.[More Info](#)

2. Please enter today's date. (Just click on 'Today' at the bottom of the calendar box. The box appears when you click in the answer space below).

(DD-MM-YYYY)

3. Please enter the time now to the nearest minute (e.g 9.06 am, 4.38 pm etc)

The Daily Focus routinely takes about 10 minutes a day

Initially it may take longer as you learn the activities. Later it may take less, particularly if your day appears relatively straightforward

Be guided by what you want to address, not by set times

[Continue >](#)

Section 2 - Perceptual Intelligence

Your Daily Perceptions

Relax, take a deep breath. Consider **question 4** and tick the appropriate response. Then focus on whichever of **questions 5 (negative emotion), 6 (positive) or 7 (neutral)** is most relevant.

It is usual to pick just **ONE** each day.

The basic question for you to consider is shown in **bold type**. (HINTS for how to approach the question are shown in brackets.)

Clicking on the **"More Info"** button to the right of each question will give you **examples of how others have answered** these types of questions, plus any **useful tips**.

You can write as much or as little as you like. The key is to **understand the source of your feelings** and **decide how best to respond**.

4. Please indicate your main or general feeling about how **the past day** has gone.

	Extremely negative	Quite a bit negative	Slightly negative	Neutral	Slightly positive	Quite a bit positive	Extremely positive
a. Your main feeling / emotion?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

5. If negative, what is or was your initial impression or reaction? What's your objective rational assessment? What constructive action can you take?

[More Info](#)

(HINTS: Note your emotions and which goal(s) appeared blocked or threatened. What assumptions or **perceptual biases** [see 'More Info'] might be contributing to your feelings? What are the facts? What's the most balanced 'rational' assessment you can make at the present time? What can you do to clarify things or make progress towards your goal?) (Optional)

6. If positive, what went well? What's your objective balanced assessment of what happened? What constructive action can you take to build on this?

[More Info](#)

(HINTS: Note your emotions and the goal(s) you made progress with. Are there any **perceptual biases** contributing to your feelings? What's your balanced rational assessment of what happened? What constructive action can you take to create further positive experiences like this?) *(Optional)*

7. If relatively neutral, where is this feeling coming from? What's your adult rational assessment of the situation? What constructive action can you take to improve things?

[More Info](#)

(HINTS: Note your emotions and any particular goals you feel you might have been neglecting e.g. an important issue you're not addressing. Or is there a particular goal you feel you're not making enough progress with? Are there any possible **perceptual biases** influencing your thinking? What are the facts? What's your balanced rational assessment of the situation? What constructive action can you take?) *(Optional)*

Now decide at least **one specific constructive action** you will take over the **next 24 hours** to improve your situation.

It doesn't matter how small it is - just take a step in the right direction.

Use the Tactical Intelligence activities in the next section to decide when, where and how you will fit your **constructive action** into your daily plan.

[Continue >](#)

MORE INFORMATION BOX CONTENTS – Question 5

EXAMPLE ANSWER

1. IMPULSIVE REACTING

Emotions & goals

I feel quite frustrated and angry. My goal was to get the main sections of the X ... report finished today, but I just seemed to spend the whole day getting side-tracked by other issues. I can't see myself ever finishing it by Friday. I'm worried it will reflect badly on me (goal of being professional/competent). I'm worried if I mess up, I could be more vulnerable to redundancy (goal of earning a living). But I feel I'm too nice and get dumped on (undermines self-image goal – I want to be more assertive and confident and able to say no more often).

Assumptions/biases

I can see a number of possible impulsive self biases influencing my thinking/feelings: e.g. emotional reasoning (see bias list below), i.e. casting everything in a negative light; also catastrophizing, i.e. imagining losing my job. I'm also assuming I can't finish the report by Friday, which is not necessarily true.

2. RATIONAL THINKING

Facts

I didn't manage to finish the main sections of my report today. This is because I spent a lot of time helping my colleagues with their problems. I haven't done anything wrong or to be ashamed of.

Balanced 'rational' view/interpretation

I'm frustrated because I wanted to have the report ready for Friday. It might still be possible, if I can limit further distractions. Though does it really have to be by Friday? I can ask for more time. I can explain about the help I was giving to colleagues. This doesn't necessarily mean I was being 'dumped on'. It can equally be interpreted as suggesting that I'm clearly someone colleagues feel they can approach for help. That's an asset in an organisation, not a likely cause for redundancy. I just need to be a bit more professional or organised about how I manage interruptions / requests for help.

3. RATIONAL ACTING

Actions

I will talk to my boss, see if it's possible to get a few extra days for the report. I will set aside two hours first thing on Wednesday and Thursday before I start responding to

calls and emails. I'll tell others I have to focus on a priority and will talk to them later. I will also see if J could help me with one section. After all, I saved her a lot of time today, sorting out her problem.

BE PREPARED TO BE FLEXIBLE IN YOUR THINKING - THERE ARE MANY WAYS OF INTERPRETING AND RESPONDING TO ANY SITUATION - THE MORE FLEXIBLE YOUR THINKING, THE MORE OPTIONS & FREEDOM YOU'LL HAVE

PERCEPTUAL BIASES (*IMPULSIVE THINKING*) AND REMEDIES (*RATIONAL THINKING*) CHECKLIST

Bias: Tunnel vision – focusing only on limited or certain aspects of a situation and ignoring other evidence, e.g. a pessimist might pick out only negative information and an optimist, the reverse. Also, when for example in disagreement with someone, only considering one view point, i.e. your own.

Remedy: Try to weigh up pros and cons, to generate a more balanced, whole picture view. Try to consider how other people might be thinking or feeling.

Bias: Emotional reasoning – basing your view of situations/yourself/others simply on the way you are feeling, ignoring all other evidence.

Remedy: Try to assess all the facts, not just your feelings. Also, where possible, avoid making assessments or key decisions when you're experiencing an extreme mood.

Bias: Jumping to conclusions without adequate evidence – e.g.:

- *Mind reading* – e.g. assuming you know what another person is thinking
- *Predictive thinking* – e.g. assuming that things are going to turn out badly

Remedy: Don't assume. Keep an open mind. Learn to hold off judgement until you have gathered more information.

Bias: Black and white thinking – seeing only one extreme or another, e.g. viewing significant others and/or their actions as either all good or all bad. (This, along with other biases, tends to lead to more stressful interpretations of situations.)

Remedy: Consider evidence offering a more balanced view, acknowledging possible shades of grey.

Bias: Overgeneralization – taking one instance in the past or present and imposing it on all situations (e.g. complaining 'you always ... / never ... ') or labelling yourself or

others (e.g. as being 'incompetent'), based on limited evidence and ignoring any facts inconsistent with the label.

Remedy: Be specific in your assessments. Don't rush to generalize or definitively categorise something or someone.

Bias: Catastrophizing – blowing things out of proportion. This often involves jumping to conclusions, imagining an escalating chain of negative implications.

Remedy: Just try to focus and deal with the facts of the immediate situation. Speculating about a possible chain of implications is just a waste of time. The further you extrapolate into the future, the less accurate you are likely to be. Furthermore, whatever your worst and best case scenarios, outcomes are usually in the middle, far from both extremes.

Bias: Magnification and minimisation – e.g. magnifying others' positive attributes and minimising your own. (Again, this is likely to lead to more stressful interpretations of situations.)

Remedy: Recognise that everyone has strengths and weaknesses and that though you are well aware of your own weaknesses, other people will naturally be trying to keep their weaknesses hidden from view.

Bias: Personalisation – e.g. blaming yourself for things you're not 100% responsible for.

Remedy: Recognise that life is complex and that many people contribute to the events that affect us and others.

Bias: Shoulding and musting – placing unreasonable or excessive demands/expectations on yourself or others.

Remedy: Recognise that there are many ways of doing things and that other people may have very different preferences and expectations, which will be products of their own backgrounds and experiences.

MORE INFORMATION BOX CONTENTS – Question 6

EXAMPLE ANSWER

1. IMPULSIVE REACTING

Emotions & goals

I feel really pleased with myself about how I handled the meeting yesterday with my boss. I got pretty much what I wanted. I've managed to swap a role I find really boring for something far more interesting (goal of getting more satisfaction from the work I do). I feel on a high, as if I could negotiate with anyone now.

Assumptions/biases

There's probably a bit of black and white thinking or overgeneralization, assuming I'm now a great negotiator, just based on yesterday's success with these new techniques I've been learning.

2. RATIONAL THINKING

Facts

I clearly did certain things well. I'd prepared and had it all planned out. I put effort into my rational thinking and used perceptual intelligence skills to see the situation from my boss's perspective. I imagined what her priorities or concerns might be. I'd anticipated how she might respond and had suggestions ready. And I got the outcome I'd hoped for.

Balanced 'rational' view/interpretation

Though what I did worked well, it wasn't all down to me. My boss was also in quite a cooperative mood. In another situation or another day, it might not have gone so well. I can't expect the techniques always to work. What was good though was that I approached the 'process' well. I can't control outcomes, but I can control the process. And it felt good to take the initiative, rather than just passively putting up with things I feel uncomfortable with.

3. RATIONAL ACTING

Actions

To build on this, I'm going to ask M if she would like to come up with some ideas with me on how we might be able to simplify the procedures. I'm going to use perceptual intelligence again, seeing things from management's perspective and how their concerns might be addressed. I know my job inside out and have got some good ideas. The head of the department might not be able to agree to everything, but we

should be able to come up with some improvements, which should make things easier for us and our clients.

TIPS

- Perceptual intelligence is about developing flexibility in:
 - what information/evidence you choose to focus on in situations (i.e. not just one extreme, e.g. the bad points)
 - the viewpoints you consider (i.e. not just your own)
 - what you do with the information you take in (i.e. consider more than one way of interpreting it)
- Generally, you should find you'll make better progress towards your goals, the more your thinking is:
 - open-minded rather than closed
 - flexible rather than fixed
 - constructive rather than defeatist
 - pragmatic rather than fanciful/wistful
 - accepting reality and dealing with it rather than wishing it wasn't so
 - systematic/organised rather than haphazard/sporadic
 - present or future focused rather than past
 - addressing what can rather than cannot be changed
 - **i.e. more rational thinking than impulsive thinking**

MORE INFORMATION BOX CONTENTS – Question 7

EXAMPLE ANSWER

1. IMPULSIVE REACTING

Emotions & goals

I just feel flat. I don't seem to have much colour in my life at the moment. It's just the same old routine. K is off to a wedding this weekend and all I have to look forward to for my weekend is a load of forms to complete, which I keep putting off. I'd just like something different or exciting to happen.

Assumptions/biases

I think with the contrast with K, there's probably a bit of magnification & minimisation going on, i.e. assuming everything's really exciting for her all the time and nothing for

me. It's also a bit of tunnel vision – I just keep thinking about having to do those forms this weekend.

2. RATIONAL THINKING

Facts

I have some forms to fill in this weekend. My colleague K is going to a wedding.

Balanced 'rational' view/interpretation

OK so I have some forms to fill in. Everyone does from time to time. It's part of life – accept it. As for my social and family life, a key reason why nothing much is happening is probably because I haven't put any effort in myself recently. I'm tired when I get home from work and just tend to routinely watch TV. However, I have friends and family. If I want to do more socially, there's nothing physically stopping me. It's just a question of taking the initiative and perhaps using my imagination.

3. RATIONAL ACTING

Actions

- (i) I'm going to stop procrastinating about the forms. I will get them out of the way first thing Saturday morning, so I've got the rest of the weekend free.
- (ii) I will phone D and M tomorrow and see if they would like to meet up Saturday evening.
- (iii) On Sunday evening, I will phone up G for a chat. We haven't been in touch for months. I'll see how she's doing and ask if she'd like to come and visit one weekend.
- (iv) I'm also going to start going for a proper walk at lunchtimes, to get my energy levels up. I'll ask if R would like to come too. I think he wants to get a bit fitter.

TIPS

- We feel good having nice things to look forward to. If positive events don't seem to be coming your way, stop waiting for them to happen and take the initiative. Organise something different for your family, friends or work colleagues. If you can't think of anything, invite someone else to suggest something. Even if what they suggest might not necessarily be the kind of thing you had in mind, consider giving it a try.

- From time to time, it's good to get a change of environment or perspective. So try to get away now and again. It doesn't need to be expensive or far, just different.

Different things you could try include:

- seeing a different type of film (e.g. a novel foreign language)
 - reading a different type of book
 - trying some different food from the supermarket
 - trying to cook a different dish
 - trying a different type of wine
 - trying a different type of exercise activity
 - doing something unexpected/spontaneous for someone you love, e.g. a treat when it's not their birthday
- Using your imagination (i.e. challenging habitual ways of doing things), you can also try to introduce more pleasant experiences/rewards (e.g. after completing tasks) into your working day. These can be whatever you enjoy / find appealing, e.g.:
- trying something new (e.g. yoga class in lunch break)
 - going for a walk, getting some fresh air, after completing a task
 - investing more time in a friendship with a colleague whose company you enjoy

[NOTE: Your 'impulsive self' is only problematic when it is working against your best interests (often in situations of stress). Impulsivity can of course be a positive force, when it enhances your life situation, e.g. spontaneous acts of kindness.]

Section 3 - Tactical Intelligence

Your Daily Plan

The **6 questions** below are designed to **stretch your thinking** in different directions to help you make a **more effective** daily plan.

Questions 8 and 9 can apply everyday. The rest depend on the issues you face.

Most participants usually concentrate on **Q8 and Q9 plus one other question** each day.

To keep things **fresh**, occasionally try **different** questions.

If you're stuck for **ideas**, click on the relevant **'More Info'** box.

8. What key things will you do?

[More Info](#)

(**HINTS:** What are the absolute minimum essential things you need to remember to do / accomplish today/tomorrow? How will you ensure you do this? What non-essential things can you drop or reduce to a minimum?) (*Optional*)

9. When is the best time to do them?

[More Info](#)

(**HINTS:** Where you have flexibility/scope, how are you going to order and time your activities for optimal **task efficiency**? Also for optimal **motivational efficiency** e.g. starting with something **'tough but necessary'**, adding something **'necessary and enjoyable'** and including **'enjoyable rewards/breaks'** to look forward to? [see 'More Info'] (*Optional*)

10. How can you make life / things easier?

[More Info](#)

(**HINTS:** How can you be more efficient/effective in what you're aiming to do? What specific steps/actions can you take to **reduce the task demands** [internal/external] and/or **increase the resources** [internal/external]?) (*Optional*)

11. How can you be smarter, more creative?

[More Info](#)

(**HINTS:** Are there creative ways of getting round potential problems e.g. finding an alternative route to achieving a particular end or goal? **Challenge assumptions!** What's the ultimate goal? Does it have to be done like this? Is there a simpler way? What other goals could you satisfy or make progress with?) (*Optional*)

12. What can you do today to keep up progress with your long term goals?

[More Info](#)

(**HINTS:** What little extra can you add in today that will contribute towards a long term goal e.g. addressing core needs (e.g. enhancing skills / confidence; improving relationships; giving your self more freedom/choice)? What action can you take today to advance any long term plan to improve your situation? **Note:** You can include ideas here from your 'Strategic intelligence' session.) (*Optional*)

13. How can you shape your physical and social environment to help you?

[More Info](#)

(HINTS: How can you use prompts to avoid forgetting to do things? Can you reduce or remove temptations, unhelpful distractions? What positive influences can you introduce into your work/living space? Can you improve ways of interacting with your environment e.g. healthier habits/routines?. How can you help create a more supportive co-operative atmosphere around you?) (Optional)

Now - just for a few moments - picture yourself successfully carrying out the actions you've planned.

Anticipate the satisfaction you'll get from each step achieved.

Keep a note to hand of the key things to remember.

And be kind to yourself. Not everything may work - but a lot will. So congratulate yourself on any progress you make!

14. Please indicate how you are feeling about the day ahead.

	Extremely negative	Quite a bit negative	Slightly negative	Neutral	Slightly positive	Quite a bit positive	Extremely positive
a. Your main feeling / emotion?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

[Continue >](#)

My Daily Focus



End of "Daily Focus" session

Thank you for completing your session today.

Please make a note somewhere to remember to do your next session. Thank you.

Enjoy making progress with your plans

Be flexible where necessary

**If any negative thoughts or worries come to mind during the day, don't dwell on them
Simply note them down and deal with them constructively in your next Daily Focus session**

MORE INFORMATION BOX CONTENTS – Question 8

EXAMPLE ANSWER

Essential to do

1. Number one priority is to get my application sent off today. So that means definitely going to the post office sometime today.
2. Spend at least one hour working on the new KCG spreadsheet.
3. I'm also going to make time for a walk, to have a break from the office and get some exercise.

Non-essential to drop

1. I'm going to excuse myself from the R meeting, as I have nothing to contribute this week.

TIPS

- You may find it useful to carry a notepad (or alternative that works for you) for jotting things down as they pop into your head during the day. You can then review these in your next Daily Focus session.
- A key benefit of listing things you need to do is that it gives you **reassurance and control**. This avoids the stress of your 'impulsive self' worrying about forgetting things. It also avoids last minute panics or frustration from realising that you've forgotten to do something. Your 'rational self' has it all under control!
- To avoid unnecessarily long lists, don't note down obvious routine things that will happen automatically. Note just the things you need to remember.
- Keep your list to hand and regularly consult it through the day.

Note: This activity is based on our common tendency to draw up lists, e.g. shopping lists. But as you'll see using the various TI activities, noting and listing can be used to do so much more than just remembering what to buy. For example, they can help you remember:

- what to do
- what to say, particularly in a difficult situation
- what arguments to use
- what to ask

- what time to act
- how to act
- where to go
- what order or sequence to do things in
- what to remind yourself of to boost your confidence

In the heat of the moment, it's so easy to forget what you planned, or the simplest of things. So make your lists work for you.

MORE INFORMATION BOX CONTENTS – Question 9

EXAMPLE ANSWERS

Optimising task efficiency / time use

E.g. I'll take my break early at 11.45 am to avoid lunchtime queues at the post office.

E.g. Before heading off for the conference, I'll get everything ready to leave in good time, briefcase packed, coat on, then will just sort through emails until the taxi arrives.

Optimising motivational efficiency (*Doing tough things first – easy things later.*)

1. **'Tough but necessary' tasks** – I'm going to start the day with a difficult task I've been putting off (the KCG spreadsheet). So before checking emails or answering calls, I'll get straight into it and spend a solid 45 minutes making a start on sorting out the problems. I'll then reward myself with a coffee/tea, before opening up my emails and responding to any missed calls.
2. **'Necessary and enjoyable' tasks** – This afternoon immediately after lunch, I'm going to work for a solid hour on planning the new information packs.

[**Note:** Typical tasks here are work projects you enjoy. Ideally, these should be challenging enough to engage your interest and stretch you slightly. But not too difficult, as this can lead to frustration. Also, not too easy as this can lead to boredom. Thus, if you find tasks too difficult, look for ways to make them easier. Conversely, if you find tasks too easy/boring, look for ways to make them more challenging/ interesting for yourself.]

3. **'Enjoyable rewards/breaks'** – I'm going to go for a walk this lunchtime, to get some fresh air. Also, this evening once I've sorted (chores/tasks), I'm going to: e.g. catch up with an old friend on the phone; spend time on my hobby; watch

that programme I wanted to see on BBC i player; listen to music; read a chapter of my book; do some stretching; have a nice relaxing bath; etc. [**Note:** When we set a reward for ourselves at the end of a task, we tend to be far more productive.]

TIPS

Optimising task efficiency / time use

- There are lots of ways to save time / do tasks more efficiently, if we just put some thought into it, i.e. activating our 'rational self' rather than just doing things impulsively or out of habit, e.g.:
 - avoiding crowds, peak times
 - doing things in good time to avoid last minutes rushes or forgetting things
 - planning something constructive to do in waiting periods
 - combining tasks, killing two birds with one stone

Optimising motivational efficiency

- It is easy to motivate ourselves to do things we enjoy, but difficult for things we don't enjoy, i.e. **tough but necessary** tasks. Our **rational self** knows they need to be done, but our **impulsive self** just wants to avoid them. If you wait until you feel like doing a difficult task, you'll just keep putting it off. So you just need to get on and do it. This takes will power, however, which is a limited resource. So it's best to do this when your will power is strong, i.e. usually when you're starting out in the morning or when refreshed after a break.
- Note that impulsive drives (i.e. desire for some instant positive treat/reward) are stronger when we're tired or progress towards a goal has been frustrated, creating a negative mood. The **impulsive self** doesn't have much patience, so it also helps to set clear limits on the time you intend to spend on any **tough but necessary** task and to have a reward in store after completion, so your **impulsive self** has something to look forward to.
- Setting up something **enjoyable/rewarding** for the evening, will give you something positive to look forward to. Conversely, scheduling a **tough but necessary** task (e.g. sorting out bills / filling in difficult forms) for the end of the day, tends to be demotivating. Also, if you are tired and running low on will power when you reach the end of the day, you will probably put it off.
- Thus, tackling **tough but necessary** tasks early in the day is the most sensible approach. This helps you address such issues promptly, rather than postponing

them for weeks or even months. This in turn can help stop small problems growing into bigger ones (e.g. postponing tackling a debt or health problem).

So, do the tough/important thing first. It's usually not that bad once you get into it. And once you've done it, you tend to feel much better for the rest of the day.

MORE INFORMATION BOX CONTENTS – Question 10

EXAMPLE ANSWER

REDUCING DEMANDS

Internal Demands: The document I'm working on doesn't need to be perfect. It's just a first draft. I was asked for an outline. A lot is likely to be revised later. So I'm not going to spend ages getting the wording right. I'll make it clear to X that this is just a draft.

External Demands: As I won't receive all the information I need this week, I'll propose to X that I just submit the elements I have, and will ask P and V to submit their elements directly to X.

INCREASING RESOURCES

Internal Resources: I'm going to request some IT training to help me design complex graphics more quickly/effectively. I think I could be quite good at it and it'll be a useful skill to have.

External Resources: In the meantime, I'm going to ask C if she can help me with a couple of complex charts. I can offer to help her with her backlog of filing in return, which I know she hates.

TIPS

As explained in your 'Strategic Intelligence' session, the process of reducing demands and increasing resources is referred to as **problem rebalancing**. The purpose is to make it easier to progress towards your goals. Further illustrations of how to approach this are given below:

1. **Reducing demands** – Use your imagination to generate ideas for ways in which the size or nature of tasks or problems might be reduced. The more systematic you can be, the more options you are likely to discover. A useful way to structure your thoughts is to work through the following headings:

- **Internal demands** – To what extent are the demands of the problem a function of your own expectations for yourself? Here it might be useful to consider the concept of '**satisficing**' as opposed to '**maximising**', i.e. being content with something that is 'good enough' as opposed to 'perfect', particularly for peripheral issues. Compromise is important. We tend to have a mental picture of what we're aiming for. If the complete picture is unattainable, the core essence might still be, if we're prepared to give up on some of the peripheral detail.
 - **External demands** – To what extent are the demands externally imposed? With a work-based problem, the demands might be imposed by your boss. If there's uncertainty, you may need to test your assumptions about just what exactly is required. If it's clear what your boss expects, and you feel this is too much, see if you can negotiate. What are the priorities? What are possible areas for compromise? If time is tight, don't just automatically accept deadlines you've been given. Question the time scales. Just what exactly is needed by when? Try renegotiating deadlines wherever feasible. Search for possible compromises. It might not work in all situations, but it should in some. So give it a try.
2. **Increasing resources** – Note down ways in which your resources might be greater than you think, or could be increased. Again, try to work through your options in a systematic way:
- **Internal resources** – These might include: your general knowledge / know-how; work or technical skills; personality attributes, e.g. perceptiveness, perseverance, resourcefulness, sense of humour, organisational ability, etc.; social skills, e.g. ability to seek/accept help from others. The solution may be simply to recognise and make more use of your existing resources, or to develop additional resources/skills. (N.B. The more resources you can develop through life, the greater your resilience.)
 - **External resources** – These might include: accessing various sources of information; getting help from family, friends, work colleagues, support groups, public services/agencies, etc. Also, try to identify ways you might be able to use your time more efficiently. Don't just dive into tasks. Try to think things through beforehand, to figure out the best approach.
3. **Being creative** – Try to think of novel approaches, i.e. things you might not have tried before. Don't be too quick to reject ideas. If sceptical about a possible course

of action, focus on how you could make it work. Try out new approaches.
Experiment a little. See what happens and what you can learn.

4. **Next steps** – Whatever solution you decide upon, note down what exactly you're going to do and when. Action is essential. Turn your thoughts and plans into action:
Thinking → Noting → Doing!

MORE INFORMATION BOX CONTENTS – Question 11

EXAMPLE ANSWER

Problem

I'm frustrated with W, as he hasn't responded to me with the information I need to organise this week's meeting. I'm running out of time and I'm feeling stressed.

Challenging assumptions

- Can I only get this information from W?
- Do I really need this information for the meeting to go ahead?
- Can W organise the meeting?
- Is it possible to postpone the meeting?
- Do we really need so many meetings?

TIPS

Note: Creativity is not a rare, mystical talent. It's simply about being flexible in your thinking, i.e. open to considering alternative ways of doing things. The following should help you develop your flexibility in overcoming problems:

1. **Try to recognise your own 'habitual' ways of thinking and responding to problems.** This should be relatively easy in terms of your **impulsive self**, as most of what it does is automatic and governed by habit. Your **rational self**, on the other hand, has evolved to be more flexible and adaptive. However, it too can become rigid and inflexible, i.e. following set ways of thinking about and approaching problems. Existing habits are fine, if they're working well for you, i.e. helping you advance towards your goals. If not, however, then you need to consider changing those habits, i.e. considering different ways of approaching things.

2. **Challenge the belief that there is only one way of doing things.** What might have worked in the past may no longer be appropriate or the best way now.
3. **Consider alternative routes to your goals.** Whatever current pathway or course of action appears blocked, remind yourself of the ultimate goal and list alternative routes you could take to achieve a similar outcome.
4. **Be flexible in how you define your ultimate goal.** The more flexible you are in how you set your goal, the more alternative routes you'll have for satisfying that goal. For example, if you set your goal as getting a particular person to help you with a problem, if that person can't or won't help, then you're stuck. If, however, you set your goal more flexibly, i.e. getting **someone appropriate** to help you, then you have more options if one person doesn't cooperate.
5. **Try to think of novel approaches,** i.e. things you might not have tried or considered before. Look at the situation from different angles or perspectives. For example, how might someone you admire tackle the problem? If you can't think of anything immediately, resolve to do something that might help, e.g. a change of environment to get a fresh perspective, or talking to others you think may be able to help.
6. **Don't be too quick to reject ideas.** That's often your **impulsive self**. Allow yourself time to run with ideas, to explore their potential. If sceptical about a possible course of action, consider how you could perhaps make it work. Challenge any constraints you might have in your mind. Try to stretch your thinking. Be bold. Be curious. Explore possibilities.
7. **Finally, if you can't make progress towards a particular goal in a given situation, consider different goals you could make progress with.** For example, if you fail in the goal of getting something important sorted by a particularly deadline, you could use the experience as an opportunity to:
 - revise departmental procedures, to try to avoid similar problems in the future
 - develop a better relationship and understanding with someone who might be able to help you avoid such a problem in the future
 - work on a personal goal of learning to respond to frustrations and disappointments in a calm, mature, **rational self** way

MORE INFORMATION BOX CONTENTS – Question 12

EXAMPLE ANSWERS

Improving the way I feel about myself

- Today I'm going to practise staying calm, constructive and professional (**rational self**) if and when X reacts badly (**impulsive self**) to yesterday's mistake. I can't control others, but I can control how I react to others.
- I'm going to practise being more assertive. When J keeps talking about, I'm going to explain that I need to concentrate on my work and suggest we talk about it at lunchtime.
- I'm going to build more exercise into my daily routine.

Enhancing my relationships with friends/family/colleagues

- I know M is worried about her father's health. I'm going to invite her to lunch tomorrow, to see how she's doing and to give her a bit of support.
- I'm going to suggest to E and S that we do something socially after work, a couple of times a month.
- I'm going to buy V a bunch of flowers on the way home this evening.
- We are going to do more things together as a family, e.g. more communal meals, rather than everyone eating separately.
- I haven't seen K for over a year. I'm going to ask if he wants to come and visit one weekend.

Improving my sense of choice and control

- I'm going to talk to my other team members, to see if we can come up with a list of suggestions to put to the head of department, e.g. to:
 - simplify procedures, to help reduce workload
 - reduce length and frequency of meetings
- I'm going to improve my IT skills / get some additional qualifications to enhance my longer term job options.
- I'm going to budget more carefully each week, so I can gradually pay off my debts and not be so stretched at the end of each month.

- C and I are going to keep looking into options for down-sizing, so we are not so dependent on our present level of income.
- I'm going to ask other family members if they can help with (elderly parent), by visiting her more regularly.

TIPS

So often we have ideas we'd like to pursue, but never quite find the time to do them. This activity helps us make a start. Just a little effort in a particular direction each day can have a big cumulative effect over the longer term. For example:

- Learning something new each day (e.g. bits of information, procedures, techniques etc.) can eventually build into considerable skills/expertise.
- Frequent small acts of warmth/generosity/kindness can help build friendlier, more supportive environments at work, home, etc.

MORE INFORMATION BOX CONTENTS – Question 13

EXAMPLE ANSWERS

Prompts

- I'm going to keep my Daily Focus plan to hand all the time and regularly refer and/or add to it.
- I'm going to put up a time plan on the wall, so that I keep deadlines clearly in view and can prepare in advance.
- I'm going to put a picture up next to my PC to remind me to sit upright with good posture. I'm also going to get a little timer to remind me to get up every half hour for a stretch.

Removing distractions/temptations

- I'm going to clear out all the clutter and tidy up my workspace, so I can find stuff more easily.
- As I tend to snack on (unhealthy foods) late at night, I'm going to stop buying them and will substitute them with (healthier options).
- I'm going to cut back on my satellite TV subscriptions, so I'm not tempted to watch so much TV.


TIPS

Your environment has a constant influence on you every day. So a key step in reducing stress is to modify your environment, so that it helps rather than hinders you in what you want to do. Here are some examples:

- Placing reminders in prominent places, so you don't forget something crucial.
- Placing objects (e.g. photos, quotations) in your environment that inspire and motivate you.
- Feeding your brain with stimulating ideas, e.g. seeking out books, programmes, experiences, that take you in the direction you want to go.
- Taking steps to keep temptations (e.g. unhealthy foods) out of mind / out of reach.
- Getting your body onside, e.g. improving your posture to feel more assertive.
- Challenging habitual ways of interacting with your environment. For example, instead of getting a bus all the way to your destination, try getting off a few stops sooner for a bit of a walk when the weather is good. Use stairs rather than lifts or escalators.
- Asking others for ideas. Or better still, get them involved too. Work on creating the kind of supportive and positive environment you want around you.

Don't just accept your environment as it is. Shape it so that it helps you get more of what you want out of life.

Appendix E14: Study 3: Questionnaire 2 (Time 2)

Questionnaire 2

Page 1 of 15

Welcome to Questionnaire 2 and the end of the study

Thank you for the time and effort you have put into this research study. We hope you have found it interesting.

Lessons learnt from the study will be reported back to you when all the analyses have been completed.

There are **12 sections** to this questionnaire. It is shorter than the first questionnaire at the start of the study. It usually takes around **20 minutes** to complete. Just proceed at whatever pace is comfortable for you.

All answers will be kept **strictly confidential**.

Please note that once you have clicked on the **CONTINUE** button at the bottom of each page you can not return to review or amend that page

[Continue >](#)

Page 2 of 15

Please remember that once you have clicked on the **CONTINUE** button at the bottom of each page you can not return to review or amend that page

Section 1 - Login

- Please enter the **participant ID number** you were given.[More Info](#)
- Please enter **today's date**. (Just click on 'Today' at the bottom of the calendar box. The box appears when you click in the answer space below).
 (DD-MM-YYYY)
- Please enter roughly what **time** it is now (e.g 10am, 9.15pm etc)

[Continue >](#)

This was followed by the scales below in the order shown:

PNES – 12; PSS – 10; HADS – 14; GOSS – 6; HINT – 12; W-BNS – 18; GSE – 10;
LOT-R – 10; COPE – 28.

Section 11

76. Do you think the techniques and activities in the training you have tried are useful or helpful to you?

- ☐ I don't think this training or the techniques are useful / helpful to me
- ☐ I am unsure whether this training or the techniques are useful / helpful to me
- ☐ I think this training and the techniques are moderately useful / helpful to me
- ☐ I think this training and the techniques are definitely useful / helpful to me
- ☐ Other (please specify):

77. If useful, how has the training helped you and which ideas or activities were most useful? (If the training was not useful, please type 'n/a').

78. If the training was not useful, what was the problem? What difficulties did you encounter? Can you think of something that might have worked better or improvements that might have helped? (If none or not relevant, please type 'n/a').

79. What time of day did you find works best for you for your Daily sessions?

- ☐ When I'm just winding down at the end of my working day i.e. the last thing I do before I go home
- ☐ When I'm relaxed in the evening e.g. just arrived home / just before dinner or TV or bed
- ☐ When I sit down at my work desk first thing in the morning, before I do anything else
- ☐ N/a
- ☐ Other (please specify):

80. For you personally what would be the ideal frequency of Daily sessions (e.g. everyday, every work day, weekly, other...)? What would your reasoning be for this?

81. How much flexibility / choice do you have in the timing, order or way in which you carry out your work tasks?

- ☐ I have a large amount of flexibility/choice.
- ☐ I have a moderate amount of flexibility/choice.
- ☐ I have a slight amount of flexibility/choice.
- ☐ I have no flexibility/choice.
- ☐ Other (please specify):

82. Has there been anything different or unusual about the PAST WEEK or so that may have affected your stress levels over and above the training activities? If yes, please explain briefly. (If no, please type 'none')

83. In general, how would you say your physical health has been in the PAST WEEK?

- ☐ Excellent
- ☐ Very good
- ☐ Good
- ☐ Fair
- ☐ Poor
- ☐ Bad
- ☐ Other (please specify):

84. If you participated in the cortisol assessment, are you aware of any recent changes in your physical health/condition that may have affected your hormone levels other than the training (e.g. changing medications, menopause transition, possible pregnancy, change in medical condition etc.? If yes, please explain briefly. (If none, or not relevant to you, please type 'n/a'). [see 'More Info']

[More Info](#)

[Continue >](#)

Section 12

Final Questions

85. It is common practice in research to sometimes use participants' anonymised quotes (e.g. from questionnaires / online training activities etc) in reports, publications, presentations or training materials to illustrate particular themes or issues. As indicated in the participant information sheet at the start of the study, we will only use the data in this way if participants give their permission.

(NOTE: Participants' responses in the online training activities etc., are normally already anonymised by participants themselves. However wherever necessary we will take steps to further anonymise the data to ensure that any quotes used only illustrate general issues and cannot be linked to particular individuals or situations.)

Do you give your permission for the data to be used in this way?

- ☐ Yes, I give my permission, provided any quotes are completely anonymised (i.e. cannot be linked to any particular individual or situation).
- ☐ No, I do not give my permission.
- ☐ Other (please specify):

86. Would you like to receive a report of the study findings? (Note: This will be emailed to participants.)

- ☐ Yes
- ☐ No
- ☐ Other (please specify):

87. Many studies have a 6 month follow-up to assess any longer term effects of training programmes.

Would it be OK to email you in about 6 months' time to see if you are still applying any aspects of the training and / or deriving any benefits?

- ☐ Yes
- ☐ No
- ☐ Other (please specify):

88. This is the end of the study. It is hoped the research may lead to the development of a more permanent stress management resource.

In the meantime if any participants would like to keep up their Daily activity sessions just for their own benefit, we can provide you with a link to a replica version of the webpages.

Would this be of interest to you?

- ☐ Yes
- ☐ No
- ☐ Other (please specify):

Continue >

End of Questionnaire 2

Thank you very much for completing this final questionnaire and for your overall contribution to this research study.

We hope you have found it interesting and helpful.

We will email you a report of the key findings when all the analyses have been completed.

Thank you again for your help.

.

Please don't discuss the training with any work colleagues. They may be scheduled to start the training after you and it is important to avoid them being influenced in any way. Thank you.

Appendix E15: Study 3: Six-month follow-up questionnaire (Time 3)

Stress reduction training follow-up



Page 1 of 17

Welcome to the follow-up questionnaire

There are **10 sections of questions**, followed by the **report of the study findings**.

Sections 1 to 9 are simple multi-choice questions similar to those you answered earlier this year. **Section 10** offers you the chance to give your feedback regarding any possible long term influences of the training.

The questions should take about **15 to 20 minutes** to complete.

You are welcome to copy and save the subsequent report if you wish.

[Continue >](#)

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Please remember that once you have clicked on the **CONTINUE** button at the bottom of each page you can not return to review or amend that page

Login

1. Please enter the **participant ID number** you were given.

[More Info](#)

2. Please enter **today's date**. (Just click on 'Today' at the bottom of the calendar box. The box appears when you click in the answer space below).

 (DD-MM-YYYY)

3. Please enter roughly what **time** it is now (e.g 10am, 9.15pm etc)

[Continue >](#)

This was followed by the scales below in the order shown:

PNES – 12; PSS – 10; HADS – 14; GOSS – 6; HINT – 12; W-BNS – 18; GSE – 10;
LOT-R – 10; COPE – 28.

Section 10

Final questions before report

76. Do you think the training earlier this year was useful or helpful to you AT THAT TIME?

- ☐ I don't think the training was useful / helpful to me
- ☐ I am unsure whether the training was useful / helpful to me
- ☐ I think the training was moderately useful / helpful to me
- ☐ I think the training was definitely useful / helpful to me
- ☐ Other (please specify):

77. If useful, which aspects of the training were most helpful and how? (If the training was not useful, please type 'n/a').

78. Which one of the following statements do you think most applies to you NOW?

- ☐ The training has not had any lasting influence on how I think about or respond to sources of stress.
- ☐ I'm unsure whether the training has had any lasting influence on how I think about or respond to sources of stress.
- ☐ The training has had a slight / moderate lasting influence on how I think about or respond to sources of stress.
- ☐ The training has had a considerable / significant lasting influence on how I think about or respond to sources of stress.
- ☐ Other (please specify):

79. If you now think or do anything differently to cope with stress compared to your approach before participating in the study, please briefly describe what this is. If not, please type 'n/a'.

80. How would you currently rate yourself in terms of your skills and effectiveness in reducing or managing sources of stress?

☐ Very poor
 ☐ Moderately poor
 ☐ Slightly poor
 ☐ Slightly good
 ☐ Moderately good
 ☐ Very good

81. If you think there is room for improvement in how you address or respond to sources of stress, in what way(s) do you think you could perhaps improve? *(If no suggestions, please type 'n/a').*

82. If you found the techniques helpful earlier this year but haven't maintained your daily writing sessions, can you give any reasons for not continuing with them? *(If not relevant, please type 'n/a').*

83. In general, how would you currently describe your physical health?

- ☐ Excellent
☐ Very good
☐ Good
☐ Fair
☐ Poor
☐ Bad
☐ Other *(please specify)*:

84. How much flexibility / choice do you have in the timing, order or way in which you carry out your work tasks?

- ☐ I have a large amount of flexibility/choice.
- ☐ I have a moderate amount of flexibility/choice.
- ☐ I have a slight amount of flexibility/choice.
- ☐ I have no flexibility/choice.
- ☐ Other (please specify):

85. Is there anything at present significantly affecting your stress levels? Or has there been any change in your circumstances that may have altered your stress levels or general well-being since participating in the study earlier this year? If yes to either question, please explain briefly. (If no, please type 'none')

86. Prior knowledge of the study findings could possibly influence some responses to this questionnaire. Could you please therefore indicate below whether or not you had heard anything about the results (e.g. from colleagues) before completing this questionnaire?

Select an answer

If you selected Other, please specify:

Continue >

REPORT OF STUDY FINDINGS

1. INTRODUCTION

This report summarises the key findings of the University of Bath stress reduction training study conducted between February and May 2013. It is provided as feedback for those who kindly took part.

2. BACKGROUND

How we think about and respond to stress plays a key role in determining its ultimate impact on our well-being. Insights from psychological research can help us cope more effectively with stress. Face to face training programmes have been shown to be successful in developing coping skills. However they tend to be expensive to run and so relatively few people can benefit. The present research therefore is part of an effort to find more cost effective ways of developing helpful coping skills. It also involves trying to identify which types of skills are most useful and for whom.

3. STUDY AIMS

The aim of this research study was to test the effectiveness of two different approaches to coping with stress. Training for both was provided in similar formats using online writing activities. The two types of training were:

1. **Daily Break** -- ('emotion-focused' coping) -- This sought to reduce stress by helping participants switch off from negative thoughts and emotions and relax by writing about positive, enjoyable experiences.
2. **Daily Focus** -- ('problem-focused' coping) -- This sought to reduce stress by helping participants overcome problems and make better progress towards goals.

Specific objectives of the study were to:

- Assess the effects of the two types of training on:
 - - self-report measures of psychological well-being.
 - - levels of the stress hormone cortisol (measured in saliva).
- Assess the sustainability of any effects.
- Identify factors helping predict which types of people might be most likely to benefit from the different types of training.

If you would like to keep a copy of these findings, you can copy and paste this and the subsequent pages.

Continue >

4. RESULTS

Participants

One hundred and twenty participants initially volunteered for the study. Of these 101 (70 women and 31 men) eventually started the study and 88 completed it. Forty-seven participants also volunteered for cortisol assessment. Of these, 27 ultimately provided samples that were suitable for statistical analysis. All participants were office-based staff employed by Bristol City Council.

Predictors of engagement in the training

Of the 101 participants who started the training roughly half completed 5 or more writing sessions (out of a scheduled total of 8). Engagement was slightly higher in the Daily Focus group with 56 per cent completing 5 or more writing sessions compared to 43 per cent in the Daily Break group.

For both types of training, participants' ratings of the perceived usefulness (after reading the relevant guidance notes) predicted the number of writing sessions they subsequently completed. Another key predictor was the total volume of participants' cortisol (a key stress hormone) across the day before the training. The greater the volume, the fewer writing sessions participants subsequently completed. Thus it appears that the more stressed participants were, the less effort they put into the training.

Within each type of training different personality traits predicted the number of writing sessions completed. For the Daily Break training 'openness to new experience' appeared to be the most significant predictor. For Daily Focus, 'extraversion' appeared to be most significant.

Changes in self report measures of well-being

Both types of training programme appeared to produce statistically significant improvements in self report measures of well-being. (NB If a change is calculated as being 'statistically significant' this means it is considered likely to be a genuine effect i.e. not just due to chance.) These changes included: reduced negative mood, reduced symptoms of depression and reduced symptoms of anxiety. However when the results were analysed in more detail, taking into account participant engagement (i.e. number of writing sessions completed), an interesting pattern of differences emerged.

The Daily Break (emotion focused/mental relaxation) training appeared to work for low (but not high) engagement participants, generating the following statistically significant improvements (for low engagement):

- Reduced symptoms of anxiety
- Reduced symptoms of depression

The Daily Focus (problem focused/goal progress) training however appeared to work for high (but not low) engagement participants, generating the following statistically significant improvements (for high engagement):

- Reduced symptoms of anxiety
- Reduced symptoms of depression
- Reduced perceptions of stress
- Improved progress towards goals

Changes in cortisol levels

Unfortunately the numbers of samples collected and their consistency were insufficient to detect any significant changes resulting from the training. This stemmed from a variety of problems including: participant illness before or after the training, missing one or more samples, not producing enough saliva, timing errors and changes in daily routine.

Continue >

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5. CONCLUSIONS

This study has demonstrated that it is possible to improve one's mental well-being using relatively simple online writing activities without any third party involvement (e.g. face to face advice from experts). This type of online resource therefore could possibly help organisations such as Bristol City Council better support their staff in stressful situations.

The differing levels of participant engagement however indicate that such training may not appeal to everyone. Furthermore the link between engagement and cortisol suggests that such online training may be appropriate for people with low to medium levels of stress, but not necessarily high. For the latter more direct interpersonal support may be required.

The study also demonstrated contrasting effort-reward relationships for the two types of training. The Daily Break mental relaxation approach appeared to produce good returns for low effort, but poor returns for high effort. The Daily Focus problem solving / goal progress approach appeared to produce poor returns for low effort, but good (and more extensive) returns for high effort. The latter therefore appears to offer the greater potential, provided participants are able to commit to the training.

The study also demonstrated the influence of personality traits on how people respond to different types of training. Extroverts for example appeared to engage more fully in the Daily Focus activities. A possible explanation may be that extroverts are more likely to act on and hence benefit from Daily Focus plans made to improve their situation. This highlights the importance of taking into account individual differences when devising training programmes.

Sustainability

As stress for many is a lifelong issue, it is important that any training benefits can be maintained. Participants were therefore offered the option of continuing their writing sessions (on replica webpages) beyond the end of the study. Of 42 Daily Break participants who completed the training, only one continued (for just one more session). Of 46 Daily Focus participants who completed the training, four continued with usage ranging from 3 to 22 further sessions.

As the majority of participants however did not continue, a question that naturally arises is whether any of the improvements originally derived from the training have been maintained. Benefits may have been sustained for example through participants incorporating elements of the training into their daily routines. Alternatively they may have faded without continued practice. The questionnaire you have just completed will hopefully provide some insights into this.

If you are interested in practising the techniques again or trying the alternative to the one you originally practised, both are available via the links below until the end of this year. (NB These continuation sites will not be used for research. They are just for your interest and benefit. Also please remember, you can maintain your privacy by anonymising what you write, e.g. using initials or cryptic references that only make sense to you.)

Daily Break:
<https://www.survey.bath.ac.uk/mydailybreak-continued>

Daily Focus:
<https://www.survey.bath.ac.uk/mydailyfocus-continued>

We are very grateful to everyone who participated in the study and hope you have gained some useful insights into coping with stress. If you have any questions or comments about the study findings, you are welcome to add them below.

Thank you.

Questions / Comments

87. Any questions or comments about the findings of the study? *(Optional)*

Continue >

End of follow-up questionnaire and report

Thank you very much for completing this follow-up questionnaire.

We hope you found the report interesting.

If any of your colleagues also participated in the study, we would be grateful if you could avoid discussing the results with them until they have completed this follow-up questionnaire.

Thank you again for all your help.

Appendix E16: Study 3: Cronbach's α scores for scale measures

Measure – Items	Time 1	Time 2	Time 3
PNES - Positive affect – 6	.88	.89	.89
PNES - Negative affect – 6	.86	.83	.89
PSS – 10	.90	.89	.88
HADS - Anxiety – 7	.86	.86	.85
HADS - Depression – 7	.79	.82	.80
Total GOSS – 6	.82	.88	.83
HINT – 12	.92	.91	.91
W-BNS - Autonomy – 6	.74	.75	.73
W-BNS - Competence – 6	.87	.85	.83
W-BNS - Relatedness – 6	.83	.82	.85
GSE - Self-efficacy – 10	.87	.85	.87
LOT-R - Optimism – 10	.86	.87	.86
TIPI - Agreeableness – 2	.40	-	-
TIPI - Conscientiousness – 2	.62	-	-
TIPI - Emotional stability – 2	.47	-	-
TIPI - Extraversion – 2	.69	-	-
TIPI - Openness to experience – 2	.62	-	-
CFC – 12	.85	-	-
ISEL - Appraisal support – 4	.82	-	-
ISEL - Belonging – 4	.75	-	-
ISEL - Tangible support – 4	.66	-	-

PNES = Positive and Negative Emotional Style; PSS = Perceived Stress Scale; HADS = Hospital Anxiety and Depression Scale; GOSS = Goal Oriented Subjective Status; HINT = Habit Index of Negative Thinking; W-BNS = Work-related Basic Need Satisfaction; GSE = Generalized Self-Efficacy; LOT-R = Revised Life Orientation Test; TIPI = Ten Item Personality Inventory; CFC = Consideration of Future Consequences; ISEL = Interpersonal Support Evaluation List.

Appendix E17: Study 3: Cronbach's α scores for COPE subscales

Subscale	Time 1	Time 2	Time 3
Acceptance	.62	.34	.31
Active coping	.85	.78	.76
Behavioural disengagement	.67	.65	.79
Denial	.53	.63	.24
Distraction	.52	.51	.44
Emotional support	.88	.84	.86
Humour	.89	.91	.79
Instrumental support	.88	.87	.89
Planning	.81	.78	.84
Positive reinterpretation	.79	.78	.84
Religion	.93	.92	.81
Self-blame	.79	.75	.73
Substance use	.87	.94	.95
Venting emotions	.69	.75	.73